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ABSTRACT

The impact of the general education program on students at Trenton State College (New Jersey), was assessed using the American College Measurement Program (COMP) from the American College Testing program and from Tests of General Education (TGE) from the Educational Testing Service. Participants included 144 freshmen, 32 seniors, and 37 transfer and nonmetric students who were tested with both the objective and essay components of the tests. A consideration of the findings suggests that communication skills are an area of relative strength for freshmen and remain an area of relative strength for seniors. It is suggested that problem solving skills are an area of weakness for both freshmen and seniors. The differences between men and women on the tests were striking, as senior women scored significantly higher than men on communication and significantly lower than men on mathematical thinking. Using the arts and clarifying values are areas of strength for both freshmen and seniors, but functioning in social institutions and using science and technology are areas of relative weakness. No significant difference between the scores of native and transfer seniors were found. Suggestions based on the study findings are as follows: the study should be completed longitudinally; both problem-solving and communication skills should be addressed in all courses; a special effort should be made to stress integration across disciplines; and a permanent or standing committee should be established to continue to consider the problems of general education at Trenton State College. Four appendices are: TGE objective tests; COMP objective tests; essay and scoring categories; and related letters. Tables of data are included. (Author/SM)

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# GENERAL EDUCATION

# ASSESSMENT STUDY

A Report

Submitted to the Ad Hoc Committee

on

General Education

of

Trenton State College

by

Henry Wang, Ph.D

Associate Professor of Psychology

June 1, 1985

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ABSTRACT

Impact of general education program on students at Trenton State College was assessed with American College Measurement Program (COMP) from the American College Tesing Program and from Tests of General Education (TGE) from Educational Testing Service. 144 freshmen, 32 seniors and 37 transfer and nonmetric students were tested with both the objective and essay components of the tests. Results showed that communication skills, especially for women, seemed to be an area of strength for freshmen and an area of growth while at the college. Students were weaker in problem solving skills to begin with and they might not have experienced needed enhancement of those weak skills in the various courses they took at the college. No significant difference between the scores of native and transfer seniors were found. Based on the results of the study recommendations for curriculum changes were made..

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In August of 1984, I was asked by the Ad Hoc Committee on General Education to conduct a study to assess the impact of the general education program on our students at Trenton State College. The study was finally completed with the help of my colleagues and the cooperation of our students.

I would like to express my deepest appreciation to many of my colleagues who generously gave their support and assistance during the planning of the study, the administering and grading of the tests, and the analyzing and reporting of the results.

I wish to thank especially Dr. Tony DiGiorgio and Dr. Wade Curry for their consistent and unreserved support for the project, Dr. Dan Phillips for his generous help with the computer analysis of the data, Dr. Lynn Waterhouse for her comments on the manuscript and the many questions she raised regarding the methodology and the interpretation of the results, and Professor Hager and the Ad Hoc Committee for their guidance and support. Finally, I want to thank Ms. Cindy Capritti. I relied heavily on her for the preparation of this report. Without their help, the project could not have been completed. Yet, I am fully responsible for any errors in the report.

I hope the study will make some contribution toward the goals of our college.

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General Education Assessment Study

Conclusions and Recommendations
Ad Hoc Committee on General Education

A consideration of the findings for the TGE Objective Test, the Comp Objective Test and the TGE 8 essays suggests that communication skills are an area of relative strength for our freshmen and remain an area of relative strength for our seniors. The findings also suggest that problem solving skills are an area of weakness for both our freshmen and seniors.

The TGE 8 essays show that 24% of all freshmen obtain the highest scores on all of the eight essays taken together, while 38% of seniors obtain the highest scores on all eight essays. Thus, the difference in summed meaned percentages shows that overall the percentage of high scoring seniors scores is 58% greater than the percentage of freshmen who obtain the high scores. This difference was about the same size for the four Cultural Awareness questions, as for the four Communication questions. Were these same findings to appear in a longitudinal study (i.e., today's freshmen tested four years from now), this would represent quite a considerable gain.

On the TGE Objective Test, communication skills represent the area of greatest difference between all seniors and all freshmen. The Communication subtest shows an 8.3 absolute difference in mean percentage scores between seniors and freshmen, while the mean difference between the two groups for the other subtests (Mathematics 0.12, Analytical Thinking 6.3, and Integrative Thinking 1.04) is 2.5. These differences (8.3 and 2.5 respectively) represent approximately 15% and 5% of freshmen mean scores. Once again, if the present study findings would be replicated in a longitudinal study, this difference would mean that the gain in communication skills would be three times that of the average gain in the other areas

tested. However, this comparative difference reflects as much about weakness in problem solving as it does about strength in communication skills.

The differences between men and women on the TGE Objective Test were as striking as the differences between freshmen and seniors. Senior women scored significantly higher than men on Communication and significantly lower than men on Mathematical Thinking. On the Total of TGE scores, senior males scored slightly below freshmen. Senior females, however, scored 24.7% higher than freshmen females on Communication, 18.7% higher on Analytical Thinking, and 10.1% higher on the Total test.

On the Comp (ACT) six subtests, communication skills are an area of strength for freshmen and seniors. The freshmen score at the 38th percentile and the seniors at nearly the 46th percentile on the Communication subtest. The freshmen, however, score at the 26th percentile on the Problem Solving subtest, and seniors score at approximately the 35th percentile. If these findings were to be exactly duplicated on a longitudinal study, it would mean that the gains in both areas are virtually identical (8 to 9 percentile intervals for both comparisons), but that the relative weakness in problem solving would remain a problem.

It is also important to note that on the other four subtests, Using the Arts and Clarifying Values are areas of strength for both freshmen and seniors, but Functioning in Social Institutions and Using Science and Technology are areas of relative weakness. The strength in Clarifying Values would appear to be corroborated by the large difference between freshman and senior scores on the TGE Cultural Awareness essay tests; the Cultural Awareness tests are designed to measure awareness of values underlying our culture.

Taken together, these findings suggest that our students are weaker

in problem solving skills to begin with--and they may not experience needed relatively greater enhancement of those weak skills in the various courses they take at Trenton State College. Communication skills, especially for women, seem to be an area of strength for freshmen and an area of growth while at Trenton State College.

There are no national norms for the TGE tests. On the Comp test, seniors scored at the 29th percentile on senior national norms, while freshmen scored at the 42nd percentile on freshmen national norms. It is not suprising that the freshmen did relatively better, since their SAT scores averaged 60 points higher than those of the seniors tested. SAT scores for the seniors who were tested averaged 30 points lower than those of the total senior population for whom we have scores. If all the seniors and all the freshmen had been tested, the differences would probably be greater than those found in this study. There was no significant difference between the scores of native and transfer seniors.

We have the following suggestions, based on the GE Study findings:

1) The study should be completed longitudinally--freshmen tested in 1984 should be tested again during their junior or senior year (1987) in order to see if the present cross-sectional comparisons hold up as time-change gains.
2) Both problem-solving and communication skills should be addressed in all courses, and a special focus on problem-solving across the curriculum should be established (in addition to the writing across the curriculum program now underway).
3) A special effort should be made to stress integration across disciplines, since our students exhibited weaknesses in integrative thinking on the TGE test.

4) A permanent or standing committee should be established to continue to consider the problems of general education at Trenton State College.

# INTRODUCTION

## THE TESTS

The purpose of the study was to assess the impact of the general education program on the students at Trenton State College. TSC students were tested in September, 1984 with the Comp Objective Test by ACT and with Tests of General Education (TGE) by ETS. The Comp Objective Test measures three process areas (Communication, Problem Solving, and Clarifying Values), and three content areas (Functioning within Social Institutions, Using Science and Technology, and Using the Arts.)

TGE consists of two forms, the multiple-choice form (TGE Objective Test) and the free-response form (TGE Essay Questions). The multiple-choice form assesses Communication, Mathematical Thinking, Analytic Thinking, and Integrative Thinking; the free response form (essays) assesses Communication and Cultural Awareness.

## DESIGN OF THE STUDY

The study consisted of two parts, the Comp study and the TGE study. In the Comp study, students were tested with the Comp Objective Test and the set of eight TGE essay questions. In the TGE study, students were tested with the TGE Objective Test and the same set of eight TGE essay questions (Table 1).

### Subjects for the Comp Objective Test

In the Comp study, 200 freshmen were randomly selected from the freshman population of 1039. Of the 200 freshmen, 144 participated in the testing. They were tested in September, 1984, and those who will persist to their senior year will be retested then with an equivalent set of tests in a longitudinal study.

In the cross-sectional study, 50 seniors were selected randomly from the native senior population of 352, those who have continued since

TABLE 1

TESTS USED

IN THE COMP STUDY AND THE TGE STUDY

| Tests Used in the COMP Study | Time Allowed |
|---|---|
| COMP - Objective | 120 minutes |
| TGE - Writing (4 questions) | 40 minutes |
| Cultural Awareness (4 questions) | 40 minutes |
| | 200 minutes |

| Tests Used in the TGE Study | Time Allowed |
|---|---|
| TGE - Multiple Choice | |
| Analytical | 20 minutes |
| Integrative | 20 minutes |
| Mathematical | 20 minutes |
| Written Communication | 20 minutes |
| TGE - Free Response | |
| Writing (4 questions) | 40 minutes |
| Cultural Awareness (4 questions) | 40 minutes |
| | 160 minutes |

freshmen admission; 50 additional seniors were randomly selected from the non-native senior population of 264 individuals, which include transfer and nonmatric seniors. Fifty freshmen were selected from the 200 freshmen to match the 50 native seniors, matched on SAT, high school rank, sex, and age.

Of the 50 native seniors selected, 32 participated in the testing; of the 50 transfer and nonmatric seniors, 37 participated; of the 200 freshmen selected, 144 participated (Table 2). Even though all selected subjects were strongly urged to participate, some could not participate in the study. Therefore, the samples were not as representative of the populations as the sampling plan called for.

Subjects for the TGE Objective Test

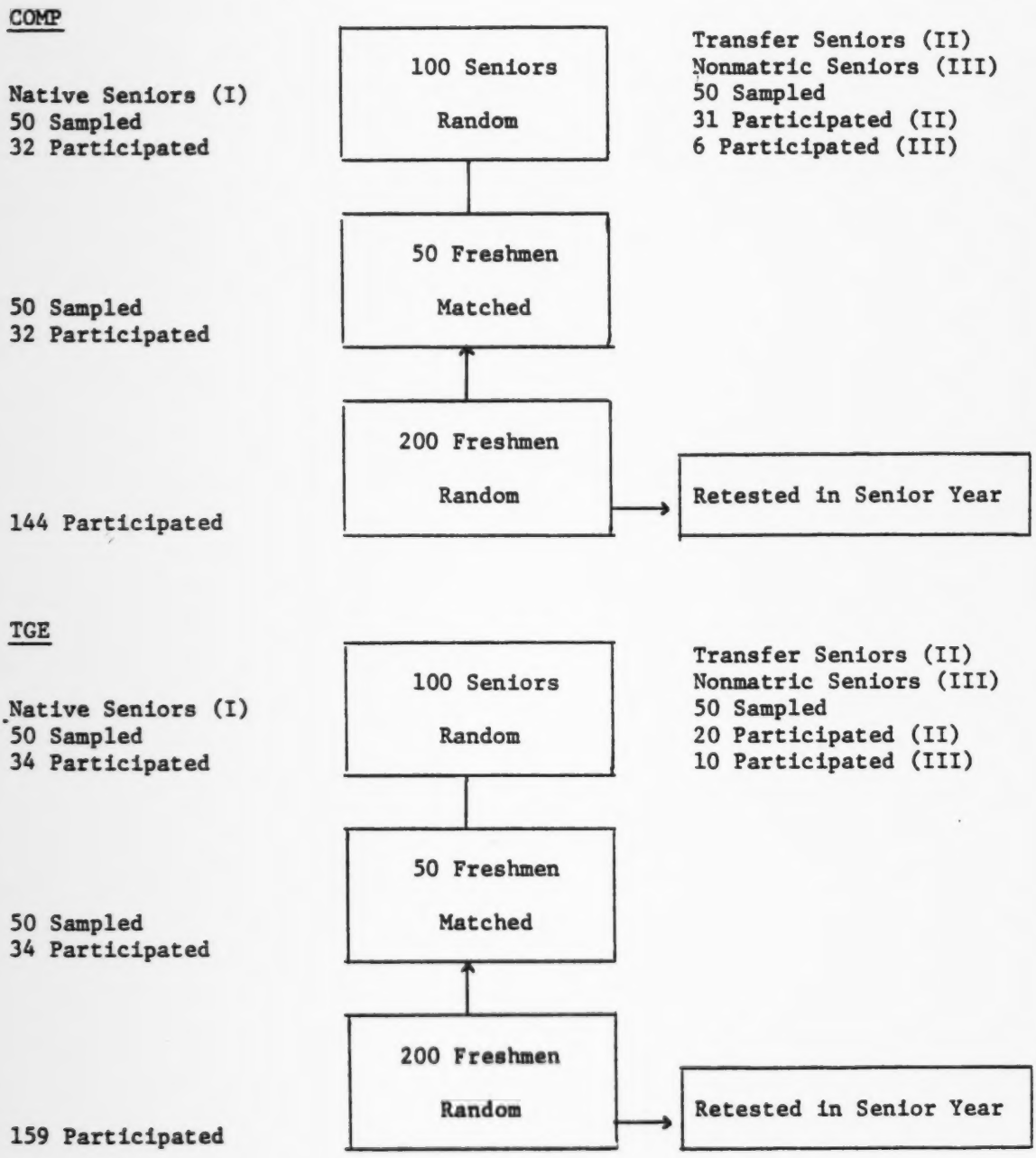
In the TGE study, the design was identical to the Comp study. Of the 200 freshmen randomly selected from the freshman population, 159 participated; of the 50 native seniors, 34 participated. Twenty transfer and nonmatric seniors took part in the study.

For both the Comp study and the TGE study, the following comparisons were made and statistical tests of significance were made of the comparisons.

1) The native seniors, the transfer seniors, all the seniors, and all the freshmen were compared with national norms to assess the relative standing of TSC students.
2) All the seniors were compared with all the freshmen to assess the outcome of the general education program.
3) The native seniors were compared with matched freshmen to assess the outcome of general education.
4) The native seniors were compared with the transfer seniors.
5) The students' subscore means were compared with one another to assess the strengths and weaknesses of TSC students.

Table 2

DESIGN



## TGE TEST RESULTS

### A. Comparing TSC Students with Students at other Institutions

Since TGE is still being developed, extensive national norms do not exist. Some comparative data, however, are available. Table 3 shows that our seniors in the TGE study performed at about the same level as the seniors at two private liberal arts colleges, and one private university in the areas of Communication and Mathematics, whereas they performed at a substantially lower level than their counterparts in areas of Analytic and Integrative Thinking.

Although these results may suggest that our seniors show a relative lack of thinking skills (Analytic and Integrative Thinking), it is difficult to assess the representativeness of the comparative data from only three unidentified institutions and the representativeness of our own sample.

No comparative data are available to assess the relative performance of our freshmen on the TGE subtests as compared with that of the students at other institutions.

### B. Comparing Seniors with Freshmen

#### 1. All Seniors vs All Freshmen

All seniors (N=64) were compared with all freshmen (N=158) on the test. Table 3 shows the mean percentages correct on TGE total and on subtests for the comparison groups. Analysis of variance (Table 4) showed that seniors did significantly better than freshmen in Communication (8.32%, $F=11.84$, df=1, $P=.0007$) and in Analytic Thinking (6.33%, $F=5.07$, df=1, $P<.05$), but no significant difference was found in Mathematical Thinking (.12%, $F=.46$, df=1, $P=.49$), Integrative Thinking (1.04%, $F=.47$, df=1, $P=.52$), or in Total Score (2.87%, $F=1.51$, df=1, $P=.22$).

Table

Mean Percentages Correct on TGE Total and Subtests
for Total Samples, Matched Subsamples.
TSC Seniors Were Compared with Three Institutions on the Tests

| | | | | | | |
|---|---|---|---|---|---|---|
| I. | Total Sample | COMM. | MATH | ANALY. | INTEG. | TOTAL |
| | 158 Freshmen | 51.7 | 61.1 | 51.7 | 47.4 | 54.0 |
| | 64 Seniors | 60.1 | 61.2 | 58.1 | 46.4 | 56.9 |
| | Difference | 8.32 | 0.12 | 6.33 | 1.04 | 2.87 |
| | F Test | 11.84*** | 0.46 | 5.07* | 0.5 | 1.51 |
| II. | MATCHED SUBSAMPLE | | | | | |
| | 34 (of 158) Freshmen | 51.9 | 56.2 | 49.5 | 44.1 | 52.2 |
| | 34 (of 64) Seniors | 60.7 | 62.6 | 57.4 | 46.5 | 54.4 |
| | Difference | 8.8 | 6.4 | 7.9 | 2.4 | 2.2* |
| | F Test | 2.27 | 3.61 | 3.45 | 0.34 | 4.08* |
| III. | NATIONAL COMPARISON OF TSC SENIORS | | | | | |
| | 64 TSC Seniors | 60.1 | 61.2 | 58.1 | 46.4 | 56.9 |
| | 270 Private Liberal Arts College Students | 59 | 65 | 66 | 55 | not available |
| | #Difference | 1.1 | -3.8 | -7.9 | -8.6 | |
| | 296 Private Liberal Arts College (Jrs. and Seniors) | 59 | 64 | 63 | 53 | not available |
| | #Difference | 1.1 | -2.8 | -4.9 | -6.6 | |
| | 205 Private University (Seniors only) | 57 | 63 | 63 | 59 | not available |
| | #Difference | 3.1 | -1.8 | -4.9 | -12.6 | |

#As compared with TSC Seniors

Table 4

Summary of Analysis of Variance
for Class by Sex Interaction
for Total Samples on TGE Total and Subtests.

| Total Score | Source | DF | SS | MS | F | P |
|---|---|---|---|---|---|---|
| | Class | 1 | 196.29 | 196.29 | 1.51 | .2198 |
| | Sex | 1 | 202.46 | 202.46 | 1.56 | .2127 |
| | Class/Sex | 1 | 439.45 | 439.45 | 3.39 | .0669 |
| **Communication** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 3543.48 | 3543.48 | 11.84*** | .0007 |
| | Sex | 1 | 3185.54 | 3185.54 | 10.64** | .0013 |
| | Class/Sex | 1 | 790.68 | 790.68 | 2.64 | .1055 |
| **Math** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 129.59 | 129.59 | .46 | .4994 |
| | Sex | 1 | 5473.21 | 5473.21 | 19.34*** | .0001 |
| | Class/Sex | 1 | 96.09 | 96.09 | .34 | .5607 |
| **Analytical** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 1317.65 | 1317.65 | 5.07* | .0254 |
| | Sex | 1 | 224.67 | 224.67 | .86 | .3537 |
| | Class/Sex | 1 | 644.98 | 644.98 | 2.48 | .1167 |
| **Integrative** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 102.66 | 102.66 | .52 | .4733 |
| | Sex | 1 | 28.09 | 28.09 | .14 | .7074 |
| | Class/Sex | 1 | 741.08 | 741.08 | 3.73 | .0549 |

Since there was a nearly significant class/sex interaction in Integrative score (F=3.73, df=1, P=.055) and in Total Score (F=3.39, df=1, P=.067), as reported in Table 4, class differences were examined for males and females separately. For the means presented in Table 5, a difference of 5.25% in favor of senior women in Total Score was found, but there was a difference of only 1.04% between senior males and freshmen males. Suprisingly, senior males did worse than freshman males by 5.6% in Integrative Thinking.

It should be pointed out that the significant differences in Communication and Analytic Thinking in favor of the seniors previously reported were primarily contributed by senior women. In comparison with freshman females, the senior women did better by 13.16% in Communication and by 9.26% in Analytic Thinking, whereas, in comparison with freshman males, senior males did better than the freshmen by smaller margins, 4.71% in Communication and 1.64% in Analytic Thinking (Table 5). The results from comparing all the seniors and all the freshmen are summarized as follows.

1) In terms of the Total Score difference between seniors and freshmen, the senior women scored well in comparison with female freshmen (a difference of 5.25%), whereas the senior men showed a small difference of 1.04% when compared with their freshman counterparts.

2) In terms of the Subscore differences between seniors and freshmen, the senior women performed well above freshman females in Communication (13.36%) and Analytic Thinking (9.26%), but they performed either at the same level or slightly better than freshman females in Mathematical Thinking (-.24%) and in Integrative Thinking (2.57%); the senior men, on the other hand, performed somewhat better than their freshman counterparts in Communication (4.71%), and in Total Score (1.04%). There was even a difference in favor of freshman

Table 5

Mean Percentages Correct on TGE Total and Subtests
for All Freshmen and All Seniors
Separated for Males and Females

| FEMALES | N | Comm. | Math | Analy. | Integ. | Total |
|---|---|---|---|---|---|---|
| Freshmen | 102 | 53.25 | 56.62 | 49.59 | 46.26 | 52.15 |
| Seniors | 32 | 66.41 | 56.38 | 58.85 | 48.83 | 57.40 |
| Difference | | 13.16 | -0.24 | 9.26 | 2.57 | 5.25 |

| MALES | N | Comm. | Math | Analy. | Integ. | Total |
|---|---|---|---|---|---|---|
| Freshmen | 56 | 49.00 | 69.20 | 55.65 | 49.55 | 57.43 |
| Seniors | 32 | 53.71 | 66.02 | 57.29 | 43.95 | 56.39 |
| Difference | | 4.71 | -3.18 | 1.64 | -5.60 | 1.04 |

males in Mathematical Thinking (-3.18%) and in Integrative Thinking (-5.6%).

3) When the senior males and females were combined, their performance in Integrative Thinking was only slightly better than the freshmen.

2. Native Seniors vs. Matched Freshmen

Table 6 shows the class differences in Total Score and in Subscores for native seniors as compared with matched freshmen. The analysis of variance (Table 7) showed that all the differences were in favor of seniors. Specifically, there was a significant class difference in Total Score (6.28%, F=4.08, df=1, P=.047), nearly significant differences in Mathematical Thinking (6.4%, F=3.61, df=1, P=.06) and in Analytic Thinking (7.9%, F=3.69, df=1, P=.068), but no significant difference in Communication (8.8%, F=2.27, df=1, P=.14), nor in Integrative Thinking (2.4%, F=.34, df=1, P=.56). Class differences for males and females were examined separately (Table 6) because of a nearly significant class/sex interaction (F=3.45, df=1, P=.06). It was found that the significant difference in favor of the seniors in Mathematical Thinking was contributed primarily by the senior men.(16.99%), whereas senior women in this group scored at virtually the same level as the freshmen women (0%).

3. A Summary

A summary of the results on class differences for all the seniors as compared with all the freshmen and for the native seniors as compared with the matched freshmen is presented in Table 8 and described below. The comparison on which the finding was based is noted in parentheses.

1) For the senior women, Communication was an area of strength, an area of large difference in favor of the senior women (all seniors vs all freshmen).

2) For the senior men, Mathematical Thinking was an area of strength,

TABLE 6

Mean Percentages Correct for Native Seniors and Matched Freshmen on TGE Total and Subtests. Class Differences, Sex Differences, and Class Differences Separated for Males and Females are Shown.

| CLASS | N | COMM. | MATH | ANAL. | INTEG. | TOTAL |
|---|---|---|---|---|---|---|
| Freshman | 33 | 51.9 | 56.2 | 49.5 | 44.1 | 51.2 |
| Senior | 34 | 60.7 | 62.6 | 57.4 | 46.5 | 57.4 |
| Difference | | 8.8 | 6.4 | 7.9 | 2.4 | 6.2 |
| P | | .14 | .06 | .068 | .56 | .047 |

| SEX | N | COMM. | MATH | ANAL. | INTEG. | TOTAL |
|---|---|---|---|---|---|---|
| Female | 41 | 59.7 | 56.0 | 54.3 | 46.3 | 54.3 |
| Male | 26 | 51.0 | 64.9 | 52.2 | 43.8 | 54.4 |
| Difference | | 8.7 | -8.9 | 2.1 | 2.5 | -0.1 |
| P | | .09 | .049 | | | |

| CLASS BY SEX | N | COMM. | MATH | ANAL. | INTEG. | TOTAL |
|---|---|---|---|---|---|---|
| Freshman Felmale | 20 | | 56.0 | | | |
| Freshman Male | 13 | | 56.4 | | | |
| Senior Female | 21 | | 56.0 | 17.0% | | |
| Senior Male | 13 | | 73.4 | difference | | |
| P | | | .059 | | | |

Table 7

Summary of Analysis of Variance for Class by Sex Interaction on TGE Total and Subtests. Native Seniors were Compared with Matched Freshmen.

| Total Score | Source | DF | SS | MS | F | P |
|---|---|---|---|---|---|---|
| | Class | 1 | 715.30 | 715.30 | 4.08* | .0476 |
| | Sex | 1 | .44 | .44 | 0.00 | .9602 |
| | Class/Sex | 1 | 56.91 | 56.91 | .32 | .5707 |
| **Communication** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 291.31 | 291.31 | 2.27 | .1368 |
| | Sex | 1 | 1188.57 | 1188.57 | 2.93 | .0919 |
| | Class/Sex | 1 | 355.26 | 355.26 | .88 | .3529 |
| **Math** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 1135.50 | 1135.50 | 3.61 | .0619 |
| | Sex | 1 | 1261.91 | 1261.91 | 4.02* | .0494 |
| | Class/Sex | 1 | 1159.63 | 1159.63 | 3.69 | .0593 |
| **Analytical** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 999.44 | 999.44 | 3.45 | .0678 |
| | Sex | 1 | 59.44 | 59.44 | .21 | .6520 |
| | Class/Sex | 1 | 2.63 | 2.63 | .01 | .9243 |
| **Integrative** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 82.04 | 82.04 | .34 | .5621 |
| | Sex | 1 | 104.21 | 104.21 | .43 | .5137 |
| | Class/Sex | 1 | 1.93 | 1.93 | .01 | .9291 |

Table

TGE OBJECTIVE

Summary of Results on Comparing Seniors with Freshmen for Full Samples and for Matched Subsamples.

| | | |
|---|---|---|
| Total Score | I | + for Senior Women only (5.2%) |
| | II | + for Seniors (5.2%) |
| Subscores | | |
| Communication | I | + for Seniors (13.16% for Women) |
| | II | 0 for Seniors |
| Math | I | 0 for Seniors |
| | II | + for Seniors (17% for Males) |
| Analytical | I | + for Seniors (9.26% for Women) |
| | II | + for Seniors (7.9%) |
| Integrative | I | 0 for Seniors (-5.6% for Men) |
| | II | 0 for Seniors (2.4%) |

"+" indicates significant difference in favor of Seniors.
"0" indicates no significant difference.

"I" refers to the comparison between all Seniors and all Freshmen.
"II" refers to the comparison between native Seniors and matched Freshmen.

an area of large difference in favor of the senior men (native seniors vs matched freshmen).

3) For both senior men and women, Analytic Thinking was a common area of moderate difference in favor of the seniors (both total sample and matched subsample comparisons).

4) For both senior men and women, Integrative Thinking was a common area of weakness (both the full sample and the subsample comparisons).

5) With the exception of the male seniors in the comparisons of full samples, seniors, as expected, did better than freshmen in terms of Total Score difference (both the full sample and the subsample comparisons).

C. Comparing Means by SAT Groups

To examine whether students with higher SAT scores performed better on the TGE Objective Test than students with lower SAT scores, the subjects in the matched subsamples were grouped by SAT quartiles. The means of the SAT groups in Total Score and in the Subscores are presented in Table 9; the analysis (Table 10) showed that there were highly significant group differences. On the basis of Duncan's multiple range tests, it was found that the means in the first quartile group differed significantly on the total and on the subtests from the means in the fourth quartile group (Table 11).

D. Comparing Native Seniors, Transfer Seniors, and Nonmatric Seniors

One of the goals of the study was to compare native seniors with transfer seniors. The mean percentages correct of the three senior groups based on admission types are shown in Table 12. A summary of the analyses (Table 13) showed that the senior groups did not differ in the Total Score or in the Subscores.

E. Comparing Means on Subtests

The mean percentages correct (Table 14) on the subtests were compared for native seniors and matched freshmen (Table 15). There were highly

Table 9

Mean Percentages Correct on TGE Total and Subtests
for Native Seniors and Matched Freshmen
Grouped by SAT Quartiles.

| Grouping by SAT Quartiles | N | COMM. | MATH | ANAL. | INTEG. | TOTAL |
|---|---|---|---|---|---|---|
| 1st | 32 | 48.24 | 51.69 | 47.14 | 38.67 | 47.01 |
| 2nd | 13 | 61.06 | 56.09 | 56.41 | 43.75 | 54.41 |
| 3rd | 10 | 61.25 | 69.58 | 60.83 | 61.25 | 64.12 |
| 4th | 10 | 70.63 | 78.33 | 63.33 | 52.50 | 67.79 |

Table 10

Summary of Analysis of Variance for Class by SAT Interaction on TGE Total and Subtests.

Native Seniors were Compared with Matched Freshmen.

| Total Score | Source | DF | SS | F | P |
|---|---|---|---|---|---|
| | Class | 1 | 846.99 | 7.71** | .0074 |
| | SAT | 3 | 4557.11 | 13.82*** | .0001 |
| | Class/SAT | 3 | 214.72 | 0.65 | .5891 |
| **Communication** | **Source** | **DF** | **SS** | **F** | **P** |
| | Class | 1 | 1665.55 | 4.37* | .0410 |
| | SAT | 3 | 4951.37 | 4.33** | .0082 |
| | Class/SAT | 3 | 240.83 | 0.21 | .8874 |
| **Math** | **Source** | **DF** | **SS** | **F** | **P** |
| | Class | 1 | 594.57 | 2.26 | .1387 |
| | SAT | 3 | 6803.24 | 8.60*** | .0001 |
| | Class/SAT | 3 | 419.41 | 0.53 | .6672 |
| **Analytical** | **Source** | **DF** | **SS** | **F** | **P** |
| | Class | 1 | 2226.14 | 9.34** | .0034 |
| | SAT | 3 | 2976.63 | 4.16** | .0098 |
| | Class/SAT | 3 | 1343.99 | 1.88 | .1417 |
| **Integrative** | **Source** | **DF** | **SS** | **F** | **P** |
| | Class | 1 | 119.14 | 0.63 | .4289 |
| | SAT | 3 | 4521.59 | 8.03*** | .0002 |
| | Class/SAT | 3 | 82.04 | 0.15 | .9286 |

Table 11

Duncan's Multiple Range Test Applied to
the Differences Between Four SAT Group Means
on TGE Total and Subtests for Native Seniors and Matched Freshmen

| Total Score | Duncan Grouping | Mean % | N | SAT Group |
|---|---|---|---|---|
| | A | 67.79 | 10 | 4th quarter |
| | A | 64.12 | 10 | 3rd quarter |
| | B | 54.41 | 13 | 2nd quarter |
| | B | 47.03 | 32 | 1st quarter |

| Communication | Duncan Grouping | Mean % | N | SAT Group |
|---|---|---|---|---|
| | A | 70.63 | 10 | 4th quarter |
| B | A | 61.25 | 10 | 3rd quarter |
| B | A | 61.06 | 13 | 2nd quarter |
| B | | 48.24 | 32 | 1st quarter |

| Math | Duncan Grouping | Mean % | N | SAT Group |
|---|---|---|---|---|
| | A | 78.33 | 10 | 4th quarter |
| | A | 69.58 | 10 | 3rd quarter |
| B | | 56.09 | 13 | 2nd quarter |
| B | | 51.69 | 32 | 1st quarter |

| Analytical | Duncan Grouping | Mean % | N | SAT Group |
|---|---|---|---|---|
| | A | 63.33 | 10 | 4th quarter |
| | A | 60.83 | 10 | 3rd quarter |
| B | A | 56.41 | 13 | 2nd quarter |
| B | | 47.14 | 32 | 1st quarter |

| Integrative | Duncan Grouping | Mean % | N | SAT Group |
|---|---|---|---|---|
| | A | 61.25 | 10 | 3rd quarter |
| B | A | 52.50 | 10 | 4th quarter |
| B | C | 43.75 | 13 | 2nd quarter |
| | C | 38.67 | 32 | 1st quarter |

Table 12

Mean Percentages Correct on TGE Total and Subtests for Native Seniors (Type I), Transfer Seniors (Type II), and Nonmatric Seniors (Type III).

| Total Score | Duncan Grouping | Mean % Correct | N | Adm. Type |
|---|---|---|---|---|
| | A | 57.91 | 10 | III |
| | A | 57.44 | 34 | I |
| | A | 55.44 | 20 | II |

| Communication | Duncan Grouping | Mean % Correct | N | Adm. Type |
|---|---|---|---|---|
| | A | 62.50 | 10 | III |
| | A | 60.66 | 34 | I |
| | A | 57.81 | 20 | II |

| Math | Duncan Grouping | Mean % Correct | N | Adm. Type |
|---|---|---|---|---|
| | A | 62.62 | 34 | I |
| | A | 59.79 | 20 | II |
| | A | 59.17 | 10 | III |

| Analytical | Duncan Grouping | Mean % Correct | N | Adm. Type |
|---|---|---|---|---|
| | A | 64.17 | 10 | III |
| | A | 57.35 | 34 | I |
| | A | 56.25 | 20 | II |

| Integrative | Duncan Grouping | Mean % Correct | N | Adm. Type |
|---|---|---|---|---|
| | A | 46.88 | 10 | III |
| | A | 46.51 | 34 | I |
| | A | 45.94 | 20 | II |

Table 13

Summary of Analysis of Variance
for Admission Type (Type I, II, III)
by Sex Interaction on TGE Total and Subtests for Seniors

| Total Score | Source | DF | SS | MS | F | P |
|---|---|---|---|---|---|---|
| | Adm. Type | 2 | 55.42 | 27.71 | .19 | .8240 |
| | Sex | 1 | 57.99 | 57.99 | .41 | .5262 |
| | Adm. Type/Sex | 2 | 145.36 | 72.68 | .51 | .6035 |
| **Communication** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Adm. Type | 2 | 104.33 | 52.17 | .21 | .8131 |
| | Sex | 1 | 1534.72 | 1534.72 | 6.11* | .0164 |
| | Adm. Type/Sex | 2 | 383.34 | 191.67 | .76 | .4710 |
| **Math** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Adm. Type | 2 | 479.13 | 239.57 | .77 | .4663 |
| | Sex | 1 | 695.42 | 695.42 | 2.24 | .1395 |
| | Adm. Type/Sex | 2 | 760.47 | 380.24 | 1.23 | .3006 |
| **Analytical** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Adm. Type | 2 | 609.72 | 304.86 | .96 | .3879 |
| | Sex | 1 | 140.71 | 140.71 | .44 | .5077 |
| | Adm. Type/Sex | 2 | 284.60 | 142.30 | .45 | .6402 |
| **Integrative** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Adm. Type | 2 | 29.93 | 14.97 | .06 | .9406 |
| | Sex | 1 | 568.78 | 568.78 | 2.33 | .1324 |
| | Adm. Type/Sex | 2 | 189.39 | 94.70 | .39 | .6803 |

Table 14

Mean Percentages Correct on TGE Subtests

for Native Seniors and Matched Freshmen

| Class | Subtest | N | Mean % Correct |
|---|---|---|---|
| Freshman | Analytical | 33 | 49.49 |
| Freshman | Communication | 33 | 51.89 |
| Freshman | Integrative | 33 | 44.13 |
| Freshman | Mathematics | 33 | 56.19 |
| Senior | Analytical | 34 | 57.35 |
| Senior | Communication | 34 | 60.66 |
| Senior | Integrative | 34 | 46.51 |
| Senior | Mathematics | 34 | 62.62 |

Table 15

Summary of Analysis of Variance in a Mixed Design for Class By TGE Subtests Interaction.

Native Seniors were Compared with Matched Freshmen. Duncan's Multiple Range Test was Applied to Subtest Means.

| Source | DF | SS | MS | F | P |
|---|---|---|---|---|---|
| Subtests | 3 | 7375.30 | 2458.43 | 11.95*** | .0001 |
| Class/Subtest | 3 | 400.22 | 133.41 | .65 | .5885 |

| Duncan Grouping | Mean % Correct | N | Subtest |
|---|---|---|---|
| A | 59.45 | 67 | Mathematics |
| B A | 56.34 | 67 | Communication |
| B | 53.48 | 67 | Analytical |
| C | 45.34 | 67 | Integrative |

significant differences among the subtest means. Duncan's multiple range test (Table 15) showed that the performance on the Mathematical and Communication subtests were significantly better than that on the Analytical and Integrative subtests, and the Integrative mean was significantly lower than any of the other subscore means. Comparative data in Table 16 suggested that the Integrative subtest was not a particularly difficult test since the mean percentages correct for the Integrative test were not substantially lower in comparison with other means for the six institutions. The lower Integrative mean for TSC students indicated that TSC students may be weak in integrative ability as measured by the Integrative subtest.

F. TGE Correlation Coefficients

Intercorrelation coefficients for age, GPA, SAT Subscores, and Total Score are presented in Table 17. The results are summarized below.

1) Age: Correlation coefficients for all 223 participants between age and the scores ranged from .02 to .21. Thus, the negligible correlations suggest that higher scores for seniors cannot be attributed to age or maturation.

2) GPA: Correlation coefficients for 64 seniors between GPA and test scores ranged from .21 to .47.

3) SAT: For all freshmen and native seniors whose SAT scores were available, SAT scores moderately correlated with test scores (.24 to .63). Even though SAT scores accounted for 36% of the variance in Total Score, 64% of the variance cannot be predicted from SAT scores.

4) Subscore intercorrelation coefficients: The subscores correlated somewhat with each other (.19 to .38) and more highly with the Total Score (.61 to .79). There was no evidence that one Subscore correlated unusually highly with either another Subscore or with

Table 16

Comparative Data
Tests of General Education
June 1983

| Institution | Form* | N | Mean | % Correct | Std. Dev. | # of Items |
|---|---|---|---|---|---|---|
| State University | 14 | 430 | 7.85 | 49 | 2.30 | |
| | 27 | 430 | 11.55 | 48 | 3.00 | |
| | 34 | 430 | 5.17 | 43 | 1.89 | |
| | 44 | 430 | 7.09 | 44 | 2.16 | |
| State University | 14 | 190 | 8.42 | 53 | 2.36 | |
| | 27 | 190 | 12.50 | 52 | 3.18 | |
| | 34 | 190 | 5.83 | 49 | 1.95 | |
| | 44 | 190 | 8.56 | 54 | 2.50 | |
| State University | 14 | 955 | 9.25 | 59 | 2.28 | |
| | 27 | 955 | 17.02 | 71 | 2.81 | |
| | 34 | 955 | 6.92 | 58 | 1.80 | |
| | 44 | 955 | 10.08 | 63 | 2.27 | |
| Private University | 18 | 205 | 9.15 | 57 | 1.83 | |
| (seniors only) | 28 | 205 | 15.09 | 63 | 2.10 | |
| | 38 | 205 | 7.50 | 63 | 1.56 | |
| | 48 | 205 | 8.52 | 59 | 1.73 | |
| Private Liberal Arts | 18 | 270 | 9.47 | 59 | 1.81 | 16 |
| College | 28 | 270 | 15.67 | 65 | 2.06 | 24 |
| (seniors only) | 38 | 270 | 7.91 | 66 | 1.51 | 12 |
| | 48 | 270 | 8.75 | 55 | 1.74 | 16 |
| Private Liberal Arts | 18 | 296 | 9.41 | 59 | 2.74 | |
| College | 28 | 296 | 15.24 | 64 | 4.29 | |
| (juniors and seniors) | 38 | 296 | 7.56 | 63 | 2.18 | |
| | 48 | 296 | 8.48 | 53 | 2.44 | |
| TSC (Comm) | 18 | 64 | 9.6 | 60 | 2.7 | 16 |
| (seniors only) (Math) | 28 | 64 | 14.7 | 61 | 4.4 | 24 |
| N=64 (Analy) | 38 | 64 | 7.0 | 58 | 2.1 | 12 |
| (Integ) | 48 | 64 | 7.4 | 46 | 2.4 | 16 |
| (Total) | | 64 | 38.7 | 57 | 7.9 | 68 |
| TSC | 18 | 158 | 8.3 | 52 | 2.9 | 16 |
| (Freshmen only) | 28 | 158 | 14.7 | 61 | 4.2 | 24 |
| N=158 | 38 | 158 | 6.2 | 52 | 1.9 | 12 |
| | 48 | 158 | 7.6 | 48 | 2.2 | 16 |
| (Total) | | 158 | 36.7 | 54 | 7.8 | 68 |

*The means and standard deviations of Forms 14 to 44 have been adjusted to the scale of Forms 18 to 48.

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Table 17

TGE Correlation Coefficients
For All Freshmen and All Seniors

| | Age | GPA | SAT | Comm. | Math | Analy. | Integ. | Total | Essay Total |
|---|---|---|---|---|---|---|---|---|---|
| N | 223 | 64 | 173 | 222 | 222 | 222 | 222 | 222 | 223 |
| Age | 1.00 | .36 | -.20 | .15 | -.02 | .21 | -.02 | .09 | -.21 |
| GPA | | 1.00 | .47 | .40 | .21 | .44 | .32 | .47 | -.29 |
| SAT | | | 1.00 | .24 | .63 | .32 | .40 | .61 | -.42 |
| Comm. | | | | 1.00 | .19 | .26 | .26 | .61 | -.44 |
| Math | | | | | 1.00 | .36 | .34 | .79 | -.32 |
| Analy. | | | | | | 1.00 | .38 | .65 | -.43 |
| Integ. | | | | | | | 1.00 | .66 | -.25 |
| Total | | | | | | | | 1.00 | -.51 |
| Essay Total | | | | | | | | | 1.00 |

the Total Score as suggested.

## COMP TEST RESULTS

The results of the Comp study were analyzed and described by the American College Testing Program (ACT) in a separate report. The results were further analyzed and tested for statistical significance locally. The results and conclusions are reported below.

A. Comparing Seniors with Freshmen

1. <u>All Seniors vs. All Freshmen</u>

All 68 seniors were compared with all 144 freshmen. The raw score means on the Comp total test and on the subtests are shown in Table 1, in which class differences, sex differences, and class differences separated for males and females are presented.

As expected, the means of seniors were greater than those of freshmen. Analyses of variance (Table 2) showed that the seniors performed significantly better than freshmen on the total test ($F=4.72$, $df=1$, $p=.03$), on Functioning in Social Institutions ($F=5.40$, $df=1$, $p=.02$), and on Solving Problems ($F=5.71$, $df=1$, $p=.02$); a nearly significant difference was found in Communication ($F=3.44$, $df=1$, $p=.06$).

It can be seen from Table 1 that males had greater means than females in the total test and in 5 of the 6 subtests. Analyses of variance (Table 2) showed that males performed significantly better than females only on Communication ($F=4.28$, $df=1$, $p=0.04$), and that none of the differences on the other subtests was significant.

Inspection of the class by sex interactions (Table 2) showed that there was no significant interaction on the total test, or on any of the subtests. Therefore, class differences were not examined separately for males or for females.

Table 1

Mean Raw Scores on Comp Total and Subtests for Total Samples. Class Differences, Sex Differences, and Class Differences Separated for Males and Females are Shown.

| Class | N | Total | FSI | US | UA | COM | SP | CV |
|---|---|---|---|---|---|---|---|---|
| Freshmen | 144 | 170.61 | 58.24 | 58.00 | 55.74 | 50.21 | 67.21 | 54.36 |
| Seniors | 68 | 177.19 | 60.71 | 59.44 | 57.99 | 51.87 | 70.76 | 55.30 |
| Difference | | 6.58 | 2.47 | 1.44 | 2.55 | 1.66 | 3.55 | 0.94 |
| F Test | | 4.74* | 5.40* | 1.84 | 2.82 | 3.44 | 5.71* | 0.89 |
| P | | 0.03 | 0.02 | 0.18 | 0.09 | 0.06 | 0.02 | 0.35 |

| Sex | N | Total | FSI | US | UA | COM | SP | CV |
|---|---|---|---|---|---|---|---|---|
| Females | 139 | 171.99 | 58.77 | 58.10 | 56.47 | 50.12 | 68.29 | 54.87 |
| Males | 73 | 174.12 | 59.52 | 59.15 | 56.45 | 51.93 | 68.47 | 54.27 |
| Difference | | 2.13 | 0.75 | 1.05 | -0.02 | 1.81 | 0.18 | -0.60 |
| F Test | | 0.10 | 0.02 | 0.89 | 0.16 | 4.28* | 0.02 | 1.53 |
| P | | 0.75 | 0.89 | 0.35 | 0.69 | 0.04 | 0.88 | 0.22 |

| Females | N | Total | FSI | US | UA | COM | SP | CV |
|---|---|---|---|---|---|---|---|---|
| Freshmen | 100 | 169.81 | 57.84 | 57.78 | 55.67 | 49.60 | 67.31 | 54.35 |
| Seniors | 39 | 177.56 | 61.15 | 58.92 | 58.51 | 51.46 | 70.82 | 56.21 |

| Males | N | Total | FSI | US | UA | COM | SP | CV |
|---|---|---|---|---|---|---|---|---|
| Freshmen | 44 | 172.43 | 59.13 | 58.50 | 55.91 | 51.61 | 67.00 | 54.39 |
| Seniors | 29 | 176.69 | 60.10 | 60.14 | 57.28 | 52.41 | 70.69 | 54.10 |
| F Test | | 0.40 | 1.62 | 0.06 | 0.35 | 0.55 | 0.00 | 1.64 |
| P | | 0.63 | 0.20 | 0.81 | 0.56 | 0.46 | 0.95 | 0.20 |

Table 2
Summary of Analysis of Variance
for Class by Sex Interaction
for All Freshmen and All Seniors
on Comp Total and Subtests

| Total Score | Source | DF | SS | MS | F | P |
|---|---|---|---|---|---|---|
| | Class | 1 | 1553.97 | 1553.97 | 4.74* | 0.03 |
| | Sex | 1 | 32.88 | 32.88 | 0.10 | 0.75 |
| | Class/Sex | 1 | 131.65 | 131.65 | 0.40 | 0.63 |
| | Error | 208 | 68209.98 | 327.93 | | |
| **Functioning in Social Institutions** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 197.37 | 197.37 | 5.40* | 0.02 |
| | Sex | 1 | 0.65 | 0.65 | 0.02 | 0.89 |
| | Class/Sex | 1 | 59.31 | 59.31 | 1.62 | 0.20 |
| | Error | 208 | 7602.39 | 36.55 | | |
| **Using Science** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 83.29 | 83.29 | 1.84 | 0.18 |
| | Sex | 1 | 40.32 | 40.32 | 0.89 | 0.35 |
| | Class/Sex | 1 | 2.64 | 2.64 | 0.06 | 0.81 |
| | Error | 208 | 9434.38 | 45.36 | | |
| **Using the Arts** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 190.85 | 190.85 | 2.82 | 0.09 |
| | Sex | 1 | 10.72 | 10.72 | 0.16 | 0.69 |
| | Class/Sex | 1 | 23.46 | 23.46 | 0.35 | 0.56 |
| | Error | 208 | 14099.28 | 67.79 | | |
| **Communication** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 76.30 | 76.30 | 3.44 | 0.06 |
| | Sex | 1 | 94.74 | 94.74 | 4.28* | 0.04 |
| | Class/Sex | 1 | 12.13 | 12.13 | 0.55 | 0.46 |
| | Error | 208 | 4609.16 | 22.16 | | |
| **Solving Problems** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 558.34 | 558.34 | 5.71* | 0.02 |
| | Sex | 1 | 2.09 | 2.09 | 0.02 | 0.88 |
| | Class/Sex | 1 | 0.35 | 0.35 | 0.00 | 0.95 |
| | Error | 208 | 20349.34 | 97.83 | | |
| **Clarifying Values** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 26.62 | 26.62 | 0.89 | 0.35 |
| | Sex | 1 | 45.94 | 45.94 | 1.53 | 0.22 |
| | Class/Sex | 1 | 49.23 | 49.23 | 1.64 | 0.20 |
| | Error | 208 | 6242.23 | 30.01 | | |

2. Native Seniors vs. Matched Freshmen

The differences between the 32 native seniors and the 32 matched freshmen were compared. The raw score means on the Comp total test and the subtests are shown in Table 3, in which class differences, sex differences, and class differences separated for males and females are presented. The results of the analyses of variance (Table 4) showd that there were no significant differences between seniors and freshmen on the total test or on the subtests at the .05 level. It should be noted that the differences tended to favor the seniors on the total test and on the subtests.

When sex differences (Table 3) were tested statistically (Table 4), no significant difference was found for the total test and for the subtests.

Class by sex interactions were examined in the analyses of variance (Table 4) and none of the interactions was found to be significant. Thus, class differences were not examined separately for males and for females.

B. Comparing Subtest Means

One of the goals of the study was to compare the subtest means to assess the strengths and weaknesses of the students at Trenton State College. Since the difficulty level of the subtests may vary from subtest to subtest, the individual scores were transformed to percentile ranks based on the nationwide senior norms group (18,568 seniors at 94 institutions) so that the performance on the subtests could be compared on a common basis. The means of the percentile ranks on the subtests for freshmen and for seniors are presented in Table 5. Analyses of variance (Table 6) showed that differences among the subtests were highly significant for freshmen ($F=13.19$, $df=5$, $p=.0001$) and for seniors ($F=6.61$, $df=5$, $p=.0001$). In terms of Duncan's multiple range tests, freshmen did significantly better on Clarifying Values, Communicating, and Using the Arts than on Using Science, Functioning in Social Institutions, and Problem Solving (Table 7); seniors did significantly better on Using the Arts,

Table 3

Mean Raw Scores for Native Seniors and Matched Freshmen on Comp Total and Subtests. Class Differences, Sex Differences, and Class Differences Separated for Males and Femlaes are Shown.

| Class | N | Total | FSI | US | UA | COM | SP | CV |
|---|---|---|---|---|---|---|---|---|
| Freshmen | 32 | 168.31 | 58.25 | 56.94 | 54.34 | 50.13 | 66.78 | 52.97 |
| Seniors | 32 | 176.94 | 60.16 | 59.63 | 58.22 | 51.66 | 70.50 | 55.44 |
| Difference | | 8.63 | 1.91 | 2.69 | 3.88 | 1.53 | 3.72 | 2.47 |
| F Test | | 3.00 | 1.44 | 2.19 | 3.23 | 1.71 | 1.81 | 2.66 |
| P | | 0.09 | 0.23 | 0.14 | 0.08 | 0.20 | 0.18 | 0.11 |

| Sex | N | Total | FSI | US | UA | COM | SP | CV |
|---|---|---|---|---|---|---|---|---|
| Females | 34 | 169.74 | 58.03 | 56.88 | 56.38 | 50.03 | 66.74 | 54.26 |
| Males | 30 | 175.90 | 60.53 | 59.87 | 56.17 | 51.87 | 70.80 | 54.13 |
| Difference | | 6.16 | 2.50 | 2.99 | -0.21 | 1.84 | 4.06 | -0.13 |
| F Test | | 1.56 | 2.81 | 2.67 | 0.01 | 2.21 | 2.23 | 0.01 |
| P | | 0.22 | 0.10 | 0.11 | 0.92 | 0.13 | 0.14 | 0.93 |

| Class/Sex | N | Total | FSI | US | UA | COM | SP | CV |
|---|---|---|---|---|---|---|---|---|
| Female Freshmen | 17 | 164.94 | 56.23 | 55.65 | 54.88 | 49.65 | 64.47 | 52.35 |
| Female Seniors | 17 | 174.53 | 59.82 | 58.12 | 57.88 | 50.41 | 69.00 | 56.18 |
| Male Freshmen | 15 | 172.13 | 60.53 | 58.40 | 53.73 | 50.67 | 69.40 | 53.67 |
| Male Seniors | 15 | 179.67 | 60.53 | 61.33 | 58.60 | 53.07 | 72.20 | 54.60 |
| F Test | | 0.04 | 1.44 | 0.02 | 0.18 | 0.46 | 0.10 | 0.98 |
| P | | 0.84 | 0.23 | 0.90 | 0.67 | 0.50 | 0.75 | 0.33 |

Table 4

Summary of Analysis of Variance for Class by Sex Interaction on Comp Total and Subtests. Native Seniors Were Compared with Matched Freshmen

| Total Score | Source | DF | SS | MS | F | P |
|---|---|---|---|---|---|---|
| | Class | 1 | 1168.01 | 1168.01 | 3.00 | 0.09 |
| | Sex | 1 | 605.68 | 605.68 | 1.56 | 0.22 |
| | Class/Sex | 1 | 16.82 | 16.82 | 0.04 | 0.84 |
| | Error | 60 | 23368.24 | 389.47 | | |
| **Functioning in Social Institutions** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 51.30 | 51.30 | 1.44 | 0.23 |
| | Sex | 1 | 99.92 | 99.92 | 2.81 | 0.10 |
| | Class/Sex | 1 | 51.30 | 51.30 | 1.44 | 0.23 |
| | Error | 60 | 2130.99 | 35.52 | | |
| **Using Science** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 116.35 | 116.35 | 2.19 | 0.14 |
| | Sex | 1 | 141.94 | 141.94 | 2.67 | 0.11 |
| | Class/Sex | 1 | 0.85 | 0.85 | 0.02 | 0.90 |
| | Error | 60 | 3188.58 | 53.14 | | |
| **Using the Arts** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 246.57 | 246.57 | 3.23 | 0.08 |
| | Sex | 1 | 0.74 | 0.74 | 0.01 | 0.92 |
| | Class/Sex | 1 | 13.88 | 13.88 | 0.18 | 0.67 |
| | Error | 60 | 4574.06 | 76.23 | | |
| **Communication** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 39.90 | 39.90 | 1.71 | 0.20 |
| | Sex | 1 | 53.80 | 53.80 | 2.21 | 0.13 |
| | Class/Sex | 1 | 10.65 | 10.65 | 0.46 | 0.50 |
| | Error | 60 | 1398.27 | 23.30 | | |
| **Solving Problems** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 214.04 | 214.04 | 1.81 | 0.18 |
| | Sex | 1 | 263.32 | 263.32 | 2.23 | 0.14 |
| | Class/Sex | 1 | 11.92 | 11.92 | 0.10 | 0.75 |
| | Error | 60 | 7086.23 | 118.10 | | |
| **Clarifying Values** | **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| | Class | 1 | 90.16 | 90.16 | 2.66 | 0.11 |
| | Sex | 1 | 0.28 | 0.28 | 0.01 | 0.93 |
| | Class/Sex | 1 | 33.28 | 33.28 | 0.98 | 0.33 |
| | Error | 60 | 2037.29 | 33.95 | | |

Table 5

Subtest Means of Percentile Ranks
Based on Nationwide Senior Norms Group
for Native Seniors and for Matched Freshmen

| Class | N | FSI | US | UA | COM | SP | CV |
|---|---|---|---|---|---|---|---|
| Freshmen | 32 | 29.61 | 28.51 | 35.92 | 38.82 | 28.79 | 33.27 |
| Seniors | 32 | 36.35 | 37.02 | 47.57 | 44.47 | 35.49 | 44.84 |

Table 6

Summary of Analyses of Variance in Percentile Ranks
Comparing Comp Subtest Means for Seniors and for Freshmen

| Class | Source | DF | SS | MS | F | P |
|---|---|---|---|---|---|---|
| Freshmen | Subtest | 5 | 22284.16 | 4456.83 | 13.19*** | 0.0001 |
| | Subjects | 143 | 338765.22 | | | |
| | Subtest/Subjects | 715 | 241583.21 | 337.88 | | |

| Class | Source | DF | SS | MS | F | P |
|---|---|---|---|---|---|---|
| Seniors | Subtest | 5 | 9573.54 | 1914.71 | 6.61*** | 0.0001 |
| | Subjects | 67 | 196057.03 | | | |
| | Subtest/Subjects | 335 | 96994.48 | 289.54 | | |

Table 7

Duncan's Multiple Range Tests
on Subtest Means in Percentile Ranks
for All Freshmen and for All Seniors

Class: Freshmen

| Duncan Grouping | Mean % | N | Subtest |
|---|---|---|---|
| A | 38.40 | 144 | Clarifying Values |
| A | 38.33 | 144 | Communicating |
| A | 38.12 | 144 | Using the Arts |
| B | 30.48 | 144 | Using Science |
| B | 28.98 | 144 | Functioning in Soc. Insti. |
| B | 25.98 | 144 | Solving Problems |

* Means with same letter were not significantly different from one another.

Class: Seniors

| Duncan Grouping | Mean % | N | Subtest |
|---|---|---|---|
| A | 46.86 | 68 | Using the Arts |
| A | 45.90 | 68 | Communicating |
| B A | 43.99 | 68 | Clarifying Values |
| B C | 38.60 | 68 | Functioning in Soc. Insti. |
| C | 35.95 | 68 | Using Science |
| C | 34.51 | 68 | Solving Problems |

*Means with same letter were not significantly different from one another.

Communicating, and Clarifying Values than on Functioning in Social Institutions, Using Science, and Solving Problems (Table 7).

C. Comparing Age Groups

It was suggested that age was related to performance on the Comp test. Seniors were grouped into three age groups: 20-22, 23-30, and 31 and older. To compare the means of three senior age groups (Table 8), analysis of variance were carried out on Comp Total Scores transformed to percentile ranks based on nationwide senior norms group (Table 9). It was found that means among the senior age groups were not significant.

D. Comparing GPA Groups

To examine whether better students performed better on the Comp test, seniors were grouped into four GPA groups: 2.00-2.49, 2.50-2.99, 3.00-3.49, and 3.50-4.00. The group means are presented in Table 10. Analysis of variance (Table 11) showed that group means differed significantly. By applying the Duncan's multiple range test on the differences between the means, it was found that the lowest GPA group (2.00-2.49) performed significantly lower on the Comp test than the two highest groups (3.00-3.49, 3.50-4.00). The results lent support to the validity of the Comp test.

E. Comparing Admission Types

One of the goals of the study was to compare the native seniors with transfer seniors on the Comp test. The mean percentile ranks of the native seniors, transfer seniors, and nonmatric seniors are shown in Table 12. The results of the analysis of variance (Table 13) showed that native seniors, transfer seniors, and nonmatric seniors did not differ significantly in their performance on the Comp test.

F. Intercorrelation Coefficients

The intercorrelation coefficients for age, GPA, SAT, Comp Total Score, and Subscores are presented in Table 15. The results are interpreted as follows.

Table 8

Duncan's Multiple Range Test
Comparing Mean Percentile Ranks for Comp Total Score
for Three Senior Age Groups

| Duncan Grouping | Mean % | N | Age Group |
|---|---|---|---|
| A | 41.40 | 50 | 20-22 |
| A | 31.19 | 13 | 23-30 |
| A | 20.80 | 5 | 31 and older |

*Means with same letter were not significantly different from one another.

Table 9

Summary of Analysis of Variance
on Comp Total Test Score in Percentile Ranks
Based on Nationwide Senior Norms Group.
Three Age Groups for Seniors were Compared.

| Source | DF | SS | MS | F | P |
|---|---|---|---|---|---|
| Age Group | 2 | 2659.78 | 1329.89 | 1.75 | 0.18 |
| Error | 65 | 49335.94 | 759.01 | | |

Table 10

Duncan's Multiple Range Test
Comparing Senior GPA Group Means of Percentile Ranks
on Comp Total Test

| Duncan Grouping | | Mean % | N | GPA Group |
|---|---|---|---|---|
| | A | 47.96 | 12 | 3.5 - 4.0 |
| | A | 47.69 | 17 | 3.0 - 3.49 |
| B | A | 35.26 | 24 | 2.5 - 2.99 |
| B | | 23.14 | 15 | 2.0 - 2.49 |

*Means with same letter were not significantly different from one another.

Table 11

Summary of Analysis of Variance
Comparing Senior GPA Groups on Comp Total Test
in Percentile Ranks

| Source | DF | SS | MS | F | P |
|---|---|---|---|---|---|
| GPA Group | 3 | 6280.03 | 2093.34 | 2.93 | 0.04 |
| Error | 64 | 45714.91 | 714.30 | | |

Table 12

Mean Percentile Ranks for Native Seniors, Transfer Seniors, and Nonmatric Seniors on Comp Test

| Admission Type | N | Mean % |
|---|---|---|
| Native Seniors | 32 | 37.63 |
| Transfer Seniors | 31 | 36.77 |
| Nonmatric Seniors | 5 | 47.06 |

Table 13

Summary of Analysis of Variance
Comparing Native Seniors, Transfer Seniors, and Nonmatric Seniors
on Comp Test in Percentile Ranks

| Source | DF | SS | MS | F | P |
|---|---|---|---|---|---|
| Admission Type | 2 | 460.78 | 230.39 | 0.29 | 0.75 |
| Error | 65 | 51534.15 | 792.83 | | |

Table 14

Intercorrelation Coefficients for Age, GPA, SAT, Comp Total Score and Subscores for all Participants. Intercorrelation Coefficients Among the Subscores from ACT are Included for Comparison.

Comp Correlation Coefficients

| | AGE | GPA | SAT | COM | CV | FSI | SP | UA | US | TOT |
|---|---|---|---|---|---|---|---|---|---|---|
| N | 212 | 68 | 165 | 212 | 212 | 212 | 212 | 212 | 212 | 212 |
| AGE | 1.00 | .00 | -.21 | .05 | -.04 | .04 | .01 | .00 | .02 | .04 |
| GPA | | 1.00 | .44 | .32 | .37 | .33 | .28 | .33 | .24 | .36 |
| SAT | | | 1.00 | .42 | .33 | .35 | .32 | .33 | .36 | .43 |
| COM | | | | 1.00 | .43 | .63 | .43 | .61 | .67 | .80 |
| CV | | | | | 1.00 | .62 | .41 | .59 | .59 | .74 |
| FSI | | | | | | 1.00 | .61 | .45 | .46 | .79 |
| SP | | | | | | | 1.00 | .66 | .57 | .76 |
| UA | | | | | | | | 1.00 | .44 | .77 |
| US | | | | | | | | | 1.00 | .78 |
| TOT | | | | | | | | | | 1.00 |

Intercorrelations from ACT

| | FSI | US | UA | COM | SP | CV |
|---|---|---|---|---|---|---|
| FSI | | | | | | |
| US | .53 | .55 | | | | |
| UA | .52 | | | | | |
| COM | | | | | | |
| SP | | | | .51 | | |
| CV | | | | .51 | .58 | |

1) Age: The correlation coefficients between age and Total Score or Subscores were negligible (r=.00 - .05). The correlations showed that age was not related to Comp test scores. There was no evidence for the maturation hypotheses as speculated.

2) SAT: The SAT Total Score was moderately correlated with the Comp Total Score (r=.43) and Subscores (r=.32∼.42). Even though the SAT Total Score was related moderately to the Comp Total Score, it accounted for only 18% of the Total Score variance.

3) GPA: GPA was moderately correlated with Comp Total Score (r=.36), and with Comp Subscores (r=.24 ∼.37).

4) Subscores intercorrelations: The Subscores were moderately correlated with one another (ranging from r=.43 to .67), and more highly with the Comp Total Score (r=.74 to r=.80). The Subscore intercorrelations were roughly of the same magnitude as reported by ACT. There was no evidence that the test performance on Solving Problems was more highly correlated with the Total Comp Score as suggested. The moderate Subscore intercorrelations demonstrated that each subtest measured a unique factor of its own, even though they all measured a common factor as expected. Therefore, conclusions regarding the individual subtest scores may be drawn.

## RESULTS ON ESSAY TESTS

The essays to the Cultural Awareness questions and to the Communication questions were graded by faculty graders who had been trained to grade the essays on a 6 or 7-point scale according to criteria developed by ETS. A response of the highest quality was assigned to a "1", whereas a response of the lowest quality was assigned to a "6" or "7" depending on the question.

The response distributions in percentages for Cultural Awareness questions and for Communication questions based on the total samples and on the matched subsamples are presented in Tables 1, 2, 3, and 4, in which seniors were compared with freshmen. It should be noted that participants from both the Comp study and the TGE study were pooled together for analysis.

The largest cumulative percentage differences between seniors and freshmen and the Kolmogorov-Smirnov $x^2$ values for Cultural Awareness questions and Communication questions are shown in Tables 5 and 6.

### Cultural Awareness Tests

The results on Cultural Awareness (Table 5) for the total samples (301 freshmen, 132 seniors) showed that seniors did better than freshmen on Ephemeral Insects ($\chi^2$=25.49, df=2, p=.001), on Canada ($\chi^2$=7.89, df=2, p=.05), and on Presidential Candidate ($\chi^2$=16.28, df=2, p=.01).

There was a significant difference between seniors and freshmen for the matched subsamples on Ephemeral Insects ($\chi^2$=25.49, df=2, p=.0001) and on Presidential Candidate ($\chi^2$=5.94, df=2, p=.05).

Based on the results of statistical tests for the total samples and for matched subsamples, there was strong evidence for greater awareness of nature and of the limitations of science (Ephemeral Insects) on the part of seniors; there was also good evidence for the greater awareness of the part of seniors of the social and political events and institutions (Presidential Candidates). Since the full samples were more representative of the populations,

and less subjected to bias, one could conclude that seniors were more perceptive of the social implications of political acts (Canada) based on results from the full samples only.

Communication Tests

The results on Communication (Table 6) for the total samples (302 freshmen, 133 seniors) showed that seniors did better than freshmen on the Oil Refining question ($\chi^2$=18.40, df=2, p=.001); the results for the matched subsamples showed that seniors did better than freshmen not only on the Oil Refining question ($\chi^2$=12.13, df=2, p=.01), but also on the Life on Pluto question ($\chi^2$=6.42, df=2, p=.05).

Based on the results from the full samples and from the matched subsamples, there was strong evidence that seniors were better in using diagrams to express information presented in verbal and numerical form, an ability important in natural sciences and mathematics (Oil Refining). Based on the matched subsamples, there was some evidence that seniors did better than freshmen in their ability to use ordinary language to communicate ideas and facts presented in technical language in cultural disciplines, in technological fields, and in the physical sciences (Life on Pluto).

There was no evidence that TSC seniors were better than freshmen in their ability to expand clearly and concisely the idea that historical thinking has its own historical setting (Historical Thinking). There was also no evidence that TSC seniors were better than freshmen in their ability to rewrite short, choppy sentences into graceful, concise sentences that retain the important content (Paragraph Style).

Table 1

Response Distributions in Percentages
for Cultural Awareness Questions.
All Seniors were Compared with All Freshmen.

| | | Response Categories | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | High | | | Middle | | Low | |
| Question | N | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Insects | | | | | | | | |
| Freshmen | 301 | 5.98 | 11.96 | 15.95 | 9.97 | 29.24 | 26.91 | |
| Seniors | 132 | 12.12 | 24.24 | 21.21 | 12.86 | 16.67 | 12.66 | |
| Haiku | | | | | | | | |
| Freshmen | 301 | 3.99 | 20.27 | 22.59 | 12.96 | 23.92 | 16.28 | |
| Seniors | 132 | 7.58 | 22.73 | 18.94 | 15.15 | 12.88 | 22.73 | |
| Canada | | | | | | | | |
| Freshmen | 301 | 4.32 | 23.92 | 9.30 | 29.90 | 16.61 | 13.29 | 2.66 |
| Seniors | 132 | 9.02 | 33.83 | 8.27 | 21.05 | 12.03 | 13.53 | 2.26 |
| Candidate | | | | | | | | |
| Freshmen | 301 | 9.63 | 16.28 | 41.53 | 2.99 | 12.62 | 16.94 | |
| Seniors | 132 | 15.91 | 31.06 | 31.06 | 2.27 | 9.85 | 9.85 | |

Table 2

Response Distributions in Percentages
for Cultural Awareness Questions.
Native Seniors were Compared with Matched Freshmen.

| | | Response Categories | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | High | | Middle | | Low | | |
| Question | N | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Insects | | | | | | | | |
| Freshmen | 66 | 6.06 | 10.61 | 7.58 | 13.64 | 33.33 | 28.79 | |
| Seniors | 66 | 16.67 | 24.24 | 27.27 | 9.09 | 15.15 | 7.58 | |
| Haiku | | | | | | | | |
| Freshmen | 66 | 1.52 | 18.18 | 30.30 | 12.12 | 19.70 | 18.18 | |
| Seniors | 66 | 7.58 | 22.73 | 16.67 | 16.67 | 13.64 | 22.73 | |
| Canada | | | | | | | | |
| Freshmen | 66 | 1.52 | 28.97 | 9.09 | 30.30 | 19.70 | 6.06 | 4.55 |
| Seniors | 66 | 7.58 | 36.36 | 6.06 | 21.21 | 10.61 | 16.67 | 1.52 |
| Candidate | | | | | | | | |
| Freshmen | 66 | 10.61 | 13.64 | 39.39 | 1.52 | 12.12 | 22.73 | |
| Seniors | 66 | 12.12 | 33.33 | 37.88 | 3.03 | 7.58 | 6.06 | |

Table 3

Response Distributions in Percentages
for Communication Questions.
All Seniors were Compared with All Freshmen.

| | | Response Categories | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | High | | Middle | | Low | | |
| Question | N | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Oil Refining | | | | | | | | |
| Freshmen | 302 | 1.66 | 6.29 | 6.29 | 14.57 | 14.24 | 56.95 | |
| Seniors | 133 | 2.26 | 18.80 | 9.77 | 20.30 | 12.78 | 36.09 | |
| Paragraph Style | | | | | | | | |
| Freshmen | 302 | 14.24 | 31.13 | 23.18 | 9.93 | 13.91 | 0.99 | 6.62 |
| Seniors | 133 | 19.55 | 25.56 | 21.80 | 11.28 | 11.28 | 0.75 | 9.77 |
| Life on Pluto | | | | | | | | |
| Freshmen | 302 | 14.53 | 16.61 | 22.49 | 25.95 | 11.42 | 2.08 | 6.92 |
| Seniors | 133 | 17.69 | 23.85 | 10.00 | 24.62 | 9.23 | 4.62 | 10.00 |
| Historical Thinking | | | | | | | | |
| Freshmen | 302 | 8.28 | 11.59 | 7.62 | 16.56 | 6.95 | 17.22 | 31.78 |
| Seniors | 133 | 9.77 | 14.29 | 8.27 | 17.29 | 9.77 | 12.03 | 28.57 |

Table 4

Response Distributions in Percentages
for Communication Questions.
Native Seniors were Compared with Matched Freshmen.

| | | Response Categories | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | High | | | Middle | | Low | |
| Question | N | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Oil Refining | | | | | | | | |
| Freshmen | 66 | 1.52 | 4.55 | 6.06 | 12.12 | 12.12 | 63.64 | |
| Seniors | 66 | 0.00 | 19.70 | 13.64 | 21.21 | 12.12 | 33.3 | |
| Paragraph Style | | | | | | | | |
| Freshmen | 66 | 19.70 | 19.70 | 19.70 | 15.15 | 10.61 | 3.03 | 12.23 |
| Seniors | 66 | 19.70 | 22.73 | 24.24 | 13.64 | 10.61 | 0.00 | 9.09 |
| Life on Pluto | | | | | | | | |
| Freshmen | 66 | 11.11 | 11.11 | 14.29 | 30.16 | 19.05 | 0.00 | 14.29 |
| Seniors | 66 | 13.85 | 29.23 | 9.23 | 29.23 | 12.31 | 1.54 | 3.08 |
| Historical Thinking | | | | | | | | |
| Freshmen | 66 | 6.06 | 13.64 | 3.03 | 19.70 | 7.58 | 18.18 | 30.30 |
| Seniors | 66 | 10.61 | 13.64 | 6.06 | 19.70 | 12.12 | 12.12 | 24.24 |

Table 5

Largest Cumulative Percentage Differences
and Kolmogorov-Smirnov Chi-Square Values
for Cultural Awareness Questions.
Seniors were Compared with Freshmen
in the Total Samples and the Matched Subsamples.

| I. Total Sample | Insects | Haiku | Canada | Candidate |
|---|---|---|---|---|
| 301 Freshmen | 43.85 | 83.72 | 28.24 | 25.91 |
| 132 Seniors | 70.45 | 77.27 | 42.86 | 46.97 |
| Difference | 26.60 | 6.45 | 14.62 | 21.06 |
| Kolmogorov-Smirnov $x^2$ | 25.97*** | 1.53 | 7.89* | 16.28** |

| II. Matched Subsample | Insects | Haiku | Canada | Candidate |
|---|---|---|---|---|
| 66 (of 301) Freshmen | 24.24 | 19.70 | 30.30 | 65.15 |
| 66 (of 132) Seniors | 68.18 | 30.30 | 43.94 | 86.36 |
| Difference | 43.94 | 10.60 | 13.64 | 21.21 |
| Kolmogorov-Smirnov $x^2$ | 25.49*** | 1.48 | 2.46 | 5.94* |

Table 6

Largest Cumulative Percentage Differences
and Kolmogorov-Smirnov Chi-Square Values
for Communication Questions.
Seniors were Compared with Freshmen
in the Total Samples and the Matched Subsamples.

| I. Total Sample | Oil | Paragraph | Pluto | Historical |
|---|---|---|---|---|
| 302 Freshmen | 28.81 | 14.24 | 31.14 | 52.32 |
| 133 Seniors | 51.13 | 20.30 | 42.31 | 60.15 |
| Difference | 22.32 | 6.06 | 11.17 | 7.83 |
| Kolmogorov-Smirnov $x^2$ | 18.40*** | 1.36 | 4.48 | 2.26 |

| II. Matched Subsample | Oil | Paragraph | Pluto | Historical |
|---|---|---|---|---|
| 66 (of 302) Freshmen | 24.24 | 59.09 | 22.22 | 51.52 |
| 66 (of 133) Seniors | 54.55 | 66.67 | 44.62 | 63.64 |
| Difference | 30.31 | 7.58 | 22.40 | 12.12 |
| Kolmogorov-Smirnov $x^2$ | 12.13** | 0.76 | 6.42* | 1.94 |

# DISCUSSION

## TGE STUDY AND COMP STUDY

### A. Interpreting Class Differences

To assess the outcome of the general education program at Trenton State College, native seniors were compared with matched freshmen, and all seniors were compared with all freshmen in both the TGE and the Comp studies.

In the Comp study, no significant difference was found between the native seniors and the matched freshmen in the Total Score. In the TGE study, the native seniors performed better than the matched freshmen in the Total Score.

It can be recalled that in the matched subsample design the native seniors were matched with freshmen on SAT, high school rank, sex, and age. Thus, the difference found in the TGE study between the two groups could not be attributed to the matching variables. The results supported the hypothesis that the difference could be attributed to the outcome of the general education courses taken at Trenton State College.

In the total sample comparison, seniors performed better than freshmen in the Comp Total Score; yet in the TGE study, only senior females did better than freshmen females in the Total Score. While the differences in favor of the seniors found in both studies were consistent with the hypothesis, given many uncontrolled variables that existed, it would be difficult to attribute any of the differences in favor of the seniors to the outcome of general education courses taken.

To have a more rigorous assessment of the outcome of the general education program, the longitudinal study as planned should be completed, i.e., the freshmen tested in 1984 should be tested again during their junior or senior year.

B. Representativeness of Samples

As described in the Subjects section of the Introduction, representative freshmen and senior samples were randomly selected from their respective populations; some of the selected subjects, however, were not able to participate in the studies for various reasons. Thus, questions can be raised regarding the extent to which the samples represented the populations.

One way to assess the representativeness of the samples was to examine the SAT means of the samples and the populations. Table 1 shows the mean SAT scores for the freshmen and the seniors in the TGE study and the Comp study. It can be seen from the table that the mean SAT scores for the native seniors were 50 - 60 points below that of the freshmen tested. Thus, the differences between all freshmen and all seniors at Trenton State College may be greater than those found in the present studies. The table also shows that the mean SAT scores for the native seniors tested were 23 - 34 points below that of all native seniors at Trenton State College. Thus, in comparison with nationwide senior norms for the Comp scores, the percentile ranks may be higher for all the seniors at Trenton State College.

C. Significance of a Small Class Difference

In the Comp study, a Total Score difference of 6.6 in the total sample comparison and a difference of 8.6 in the matched subsample comparison were found. The significance of the class differences can be assessed in several ways.

1) In comparison with 67 institutions, according to data provided by ACT, a difference of 8.6 points was a median difference. In other words, half of the 67 institutions obtained smaller differences, whereas the other half obtained greater differences. Therefore, a seemingly small class difference may represent a meaningful difference for a test of general knowledge and skills.

2) The items sampled a vast domain of knowledge and skills; a one-point difference on the test may represent a large difference in knowledge and skills for a group of individuals.

3) According to ACT studies, institutions varied in average Total Score gain from 0 to 20. An institution with a score gain of less than 3.0 (percentile rank of 15) is viewed as having no significant impact on the student growth, whereas one with a score gain of 11.00 or more (percentile rank of 80) is viewed as having great impact. A typical score gain was 7.00 (percentile rank of 50). It should be noted that a 4-point difference in mean score gain distinguishes an institution which is viewed as having great impact from a typical institution. The same difference also distinguishes a typical institution from a "marginal" institution.

4) The practical significance of score gains can be understood in terms of outcome indicators.

Institutions with an above-average score gain (10.4, 75th percentile) have an average persistence to graduation rate of 58%, whereas those with below average score gains (5.9, 45th percentile) have 47%.

Institutions with a 9.8 score gain provide the most comprehensive program for orientation and advising, whereas institutions with an 8.2 score gain provide the least.

Institutions with an 11.6 score gain have student-oriented goals and proficiency examinations, whereas institutions with a 5.9 score gain have neither.

Institutions with an 8.9 score gain have a general education component and an even distribution of the general education courses in their academic program, whereas institutions with a 3.8 score gain have a small component and an uneven distribution.

Institutions with an 8.8 score gain provide formal remedial and off-campus instructions, whereas institutions with a 4.6 score gain provide neither.

It is clear from the above data that a seemingly small class difference may be of profound significance.

D. Results on the Questionnaire

Toward the end of the testing session, the students were asked to answer four questions in a questionnaire. The four questions and the distributions of responses in percentages are shown in Table 2. The results showed that almost all the students were either tired or very tired toward the end of the testing session. The reported condition of physical fatigue was understandable since the testing sessions lasted more than three hours, and were scheduled in the evenings for the majority of the students. If the participants had been less tired, they would have performed better on the tests.

According to the results, more than 75% of the students reported that they tried to perform on the tests fairly well or that they tried their very best. While the results lent support to the validity of the test results, one should keep in mind that the factor of social desirability might have influenced their responses.

The questionnaire results also showed that more than 85% of the participants would not volunteer to take the tests if they were not required to. Apparently, the participants were not highly motivated to take part in the testing.

To recruit and to motivate the sample of students to perform well in the assessment activities, several strategies were employed. The strategies included:

1) personal contact by faculty members (Appendix D1, D4)
2) providing background information through mass media about the importance of the assessment effort
3) letters to participants about the importance of the assessment effort and some details of the assessment activities (Appendix D2, D3)
4) offers to participants to provide written feedback of individual test results and group norms (Appendix D2)
5) offers to participants to provide individual counseling follow-up, if

desired (Appendix D5)

While the strategies used were effective to some extent in recruiting and motivating the participants, other strategies can be used to create more favorable motivating conditions, such as:

1) making test participation a part of an appropriate course
2) creating a course that features testing
3) making testing participation a requirement for entrance, continuance, and/or graduation.

Table 1

Mean SAT Scores for Freshmen and Native Seniors

TGE

| | Population | | Sample | | |
|---|---|---|---|---|---|
| | N | Mean SAT | N | Mean SAT | Difference |
| Freshmen | 1039 | 947.3 | 142 | 960.1 | +12.8 |
| Native Seniors | 352 | 926.7 | 32 | 892.2 | -34.5 |

COMP

| | Population | | Sample | | |
|---|---|---|---|---|---|
| | N | Mean SAT | N | Mean SAT | Difference |
| Freshmen | 1039 | 947.3 | 144 | 953 | +5.7 |
| Native Seniors | 352 | 926.7 | 32 | 903.4 | -23.3 |

Table 2

Percentage Distributions of Questionnaire Responses
for all Participants in TGE and Comp Study

Question 1: In general, how difficult were these tests for you?

| | TGE | COMP |
|---|---|---|
| A. Very easy. | 0% | 1% |
| B. Fairly easy. | 11 | 17 |
| C. Neither hard nor easy. | 36 | 37 |
| D. Fairly difficult. | 44 | 38 |
| E. Very difficult. | 7 | 6 |

Question 2: How hard did you try on these tests you've just completed?

| | | |
|---|---|---|
| A. I tried hard to do my very best. | 19% | 25% |
| B. I tried to do fairly well. | 59 | 47 |
| C. I gave these tests a half-hearted try. | 17 | 18 |
| D. I didn't try very hard to do my best. | 3 | 7 |
| E. I didn't try to do well at all. | 0 | 1 |

Question 3: How tired did you feel at the end of these tests?

| | | |
|---|---|---|
| A. Not tired. | 4% | 9% |
| B. Somewhat tired. | 56 | 49 |
| C. Very tired. | 40 | 41 |

Question 4: Would you volunteer to take these tests if you were not required to?

| | | |
|---|---|---|
| A. Yes, I would volunteer. | 13% | 15% |
| B. No, I wouldn't volunteer. | 50 | 65 |
| C. I don't know. | 35 | 19 |

REPORT OF RESULTS FOR TRENTON STATE COLLEGE

ON USE OF THE COMP OBJECTIVE TEST (FORM VII EQUATED TO III)

September 1984

COLLEGE OUTCOME MEASURES PROGRAM

AMERICAN COLLEGE TESTING PROGRAM
December 18, 1984

REPORT OF RESULTS FOR TRENTON STATE COLLEGE
ON USE OF THE COMP OBJECTIVE TEST (FORM VII EQUATED TO III)

Summary Comments and Interpretation

1. At Trenton State College, 144 freshmen and 68 seniors completed the Objective Test in September 1984. Two other students participated, but did not complete the test. Student background characteristics (enclosed) and the sampling plan should be reviewed to judge the degree to which samples obtained were representative of relevant categories at TSC.

2. A local norm table for your sample of 144 freshmen is enclosed as Table 1. Tables 2 and 3 provide reference group norms for freshmen and seniors participating in COMP. These tables may be duplicated, if desired, for use with individual students to aid in interpreting their scores compared to others participating in COMP.

3. The hypothetical "average freshman" in your sample scored at the 42nd percentile on Total score compared to freshman norms. (See Table 4.) Means for subtests ranged from the 31st to 60th percentiles, with relatively greatest strength shown in Communicating and relative weakness shown in Solving Problems. However, your freshman sample was not directly comparable with the reference group in entering level of achievement. If your sample had been directly comparable, their mean Total score might have been between the 25th and 30th percentiles on this table. Thus your sample of entering

freshmen evidenced entering levels of proficiency in general education skills and knowledge below levels for freshmen in the reference group in most areas.

4. The hypothetical "average native senior" in your sample scored at the 29th percentile on Total score compared to senior norms. (See Table 5.) Means for subtests ranged from the 24th to 45th percentiles, with relatively greatest strength shown in Communicating and relative weakness in Solving Problems. Table 5 also shows means for your samples of 31 transfer seniors and 5 special seniors. As no entering achievement scores were available for these subgroups, it is not possible to judge comparability with the sample of native seniors, and thus differences in means are difficult to interpret. The sample of Transfer seniors obtained means at similar levels to the Native senior sample on all scales.

5. Table 6 displays means by gender for your sample of freshmen, plotted on Freshman Reference Group norms. The slightly higher means obtained by the sample of men may be due in part to their slightly higher entering level of achievement. Differences in means may also be confounded by other relevant variables, such as major.

6. Table 7 displays means by gender for your senior sample, plotted on Senior Reference Group norms. Subgroups were not directly comparable in entering level of achievement and thus, though means appeared similar for men and women, the

sample of men would probably have obtained means below women if ACT/E means had been comparable.

7. Table 8 displays means by age group for your senior sample, plotted on Senior Reference Group norms. Subgroups were small and may not be representative of these age categories at TSC, and it is not known how comparable they were in entering levels of achievement. The two older samples obtained combined means well below traditional age seniors on all scales. All but two of the 18 older seniors were Transfer students.

8. Table 9 displays means by GPA group for your native senior sample, plotted on Senior Reference Group norms. The usual pattern of increasingly higher COMP means and ACT/E means for each higher GPA group was observed.

9. A subgroup of 32 freshmen matched with the 32 native senior sample was selected. Table 10 displays means for these matched freshmen and the 111 other freshmen, plotted on Freshman Reference Group norms. The lower mean Total score for the 32 matched freshmen was probably due in large part to their lower entering level of achievement.

10. Table 11 displays means for the sample of 32 native seniors and 32 matched freshmen, plotted on Senior Reference Group norms. If the sample of seniors is judged representative of native seniors at TSC, and if the freshman sample is judged directly comparable on all relevant variables, then the

freshman sample could be said to "look like" the senior sample would have looked if tested as freshmen. Thus, if these assumptions are warranted, this comparison implies gains from entry to exit in general education skills and knowledge measured by COMP. A gain of about 15 percentile points in mean Total score is implied by Table 11.

11. Table 12 displays means for all freshmen and seniors sampled at TSC, plotted on Senior Reference Group norms. The shape of the profile and amount of gain implied by this table is similar to that reflected in Table 11 on most scales.

12. A way of estimating value added from freshman to senior year has been developed using a concordance table for ACT (or equivalent) scores for the senior sample. Based on the native seniors in your sample for whom ACT/E scores were available, the average total score that group would have made on the Objective Test as freshmen can be accurately estimated. This estimate can only be made for COMP average group Total scores for seniors who took the ACT as freshmen. Subscores on the COMP tests cannot be so estimated. In a study of 67 senior institutions for whom ACT/SAT scores were available for samples of graduating seniors, the median estimated COMP Total Raw Score gain was 8 points, with 57 institutions showing gains of 3-13 points. For the 32 native seniors with ACT/E scores in your sample, the mean senior Objective Test Total score was 176.9 and the estimated freshman mean Total score was 178.2 based on an ACT mean of

21.4. Trenton State College results thus suggest no gain (actually a loss of 1.3 raw score points), which would be below all but one of the mean gains in the study of 67 senior institutions. (See Table 13.) In the cross-sectional comparison shown in Table 11, a raw score gain of 8.6 points was indicated, which would be near the median for the 67 estimated mean score gains shown in Table 13. The substantial difference in these two estimates raises some question as to the comparability of the small samples of matched freshmen and seniors in this cross-sectional study. The amount of growth probably lies somewhere between these two figures. A longitudinal study can be completed when the freshmen in your sample are ready to graduate. This longitudinal study would provide the most accurate estimate of growth from freshman to senior year. Thus results from this initial study indicated a sample of freshmen entering TSC below levels of proficiency in general education skills and knowledge shown by other freshmen participating in COMP. The sample of seniors evidenced levels of proficiency well below seniors generally. The sample of freshmen would need to average over twice the median growth shown by seniors at other institutions for whom mean gain estimates were available, in order to compare favorable with exiting levels of proficiency for seniors in the reference group of all seniors participating in COMP.

## Future Research -- Next Steps

The use of COMP has provided a comparison of the levels of proficiency of one or more samples of your students with relevant reference group norms for students at many institutions. You may have identified and compared subgroups of students at your institution that represented different treatments or background characteristics.

Some further research could involve additional analysis of the data you have collected. Other steps might involve using this data with other studies. Some future steps to consider include the following:

- If you are interested in achieving certain levels of proficiency in each area assessed by COMP:
  - You may want to look at results for each question in various areas of the test, for each subgroup of interest.
  - You may want faculty to review questions related to their areas to set standards of proficiency as well as identify areas for program improvement.
- If you are interested in judging program impact based on growth from entry to exit:
  - You may want to follow a sample of entering students you have tested and retest them at exit.

This longitudinal study will provide the most accurate estimate of growth.

- You may want to add to your study by utilizing other assessment instruments and surveys, such as the COMP Activity Inventory and the Alumni Survey from the ACT Evaluation/Survey Service.

- If you are interested in experimenting with program changes that are likely to improve student competence and persistence:

  - You may wish to review program components that COMP has identified as highly likely to increase levels of competence and persistence to graduation. See the COMP publication, Increasing Student Competence and Persistence.

  - You may wish to arrange with COMP for a program review or consultation in program development.

  - You may wish to institute continuing assessment of students to monitor program quality and verify whether changes have the desired effect.

- If you are interested in gaining support and recognition for your program:

  - You may want to review the ways other institutions have used COMP data as reported in Chapter 7 of the

## Suggestions for Interpretation of Results for Individuals

An individual score report has been provided for each student. This report contains a brief description of each scale. Students should clearly understand, however, that any single assessment of skills may not accurately reflect their levels of proficiency. Results are made available to provide students some feedback on their test performance. These results provide a relative comparison of skills with others who took the Objective Test. Individuals can profile their results on local or reference group norm tables to reveal relative strengths and weaknesses.

A caution is in order in returning results to individuals. The Objective Test is a proxy measure for a more extensive assessment of skills provided by the Composite Examination. It was designed for use in program evaluation to allow comparisons of groups and may not be as accurate and reliable an assessment of an individual's general education knowledge and skills. (The error of measurement is much smaller for group means than for individual scores.)

Each relevant norm table enclosed is based on scores for individuals, although mean scores for subgroups of interest have been plotted on some of these tables to allow general comparison of levels of performance. (These percentile tables based on

frequency distributions of individual scores should not be confused with percentile tables based on frequency distributions of mean scores.)

Participating institutions sampled students in a variety of ways and for somewhat different purposes. Thus a sample of students from one institution is not necessarily representative of all freshmen, sophomores or seniors at that institution. The reference groups of freshmen, sophomores or seniors can, however, be viewed as representing the diversity of college students participating in COMP testing. You should compare your student characteristics to those described for the reference groups (at the bottom of tables). Also consider the institutions included in the norm groups (listed on back of tables). This will allow you to judge how meaningful these comparison groups are for your institution and students.

## Data Provided with Report

Enclosed you will find the following:

1. Individual score reports.

2. Summaries of student characteristics, score frequency distributions, and means by grade level and special categories requested.

3. Scored data tape (if requested) with a layout describing location of variables.

4. A listing of data on file for each individual with notes on variables.

We would appreciate receiving your interpretations of COMP results as well as reactions to this report.

# APPENDIX

A. TGE Objective Tests

B. Comp Objective Tests

C. Essay Tests and Scoring Categories

D. Letters

1. Provost's letter to the faculty
2. Provost's letter to the students
3. Dean's letter to the faculty
4. AFT President's letter to the faculty
5. Academic Vice-President's letter to the students

Table 1

Local Percentile Table of Scores for the
COMP OBJECTIVE TEST (FORM VII)

for 144 Freshmen at Trenton State College tested in Sept 1984

Directions: Circle the place where your score falls on each scale. Refer to the Percentiles to judge your performance compared to the others tested at your institution. (For example, if your total score was 172 you scored above almost 50% of those in this comparison group.)

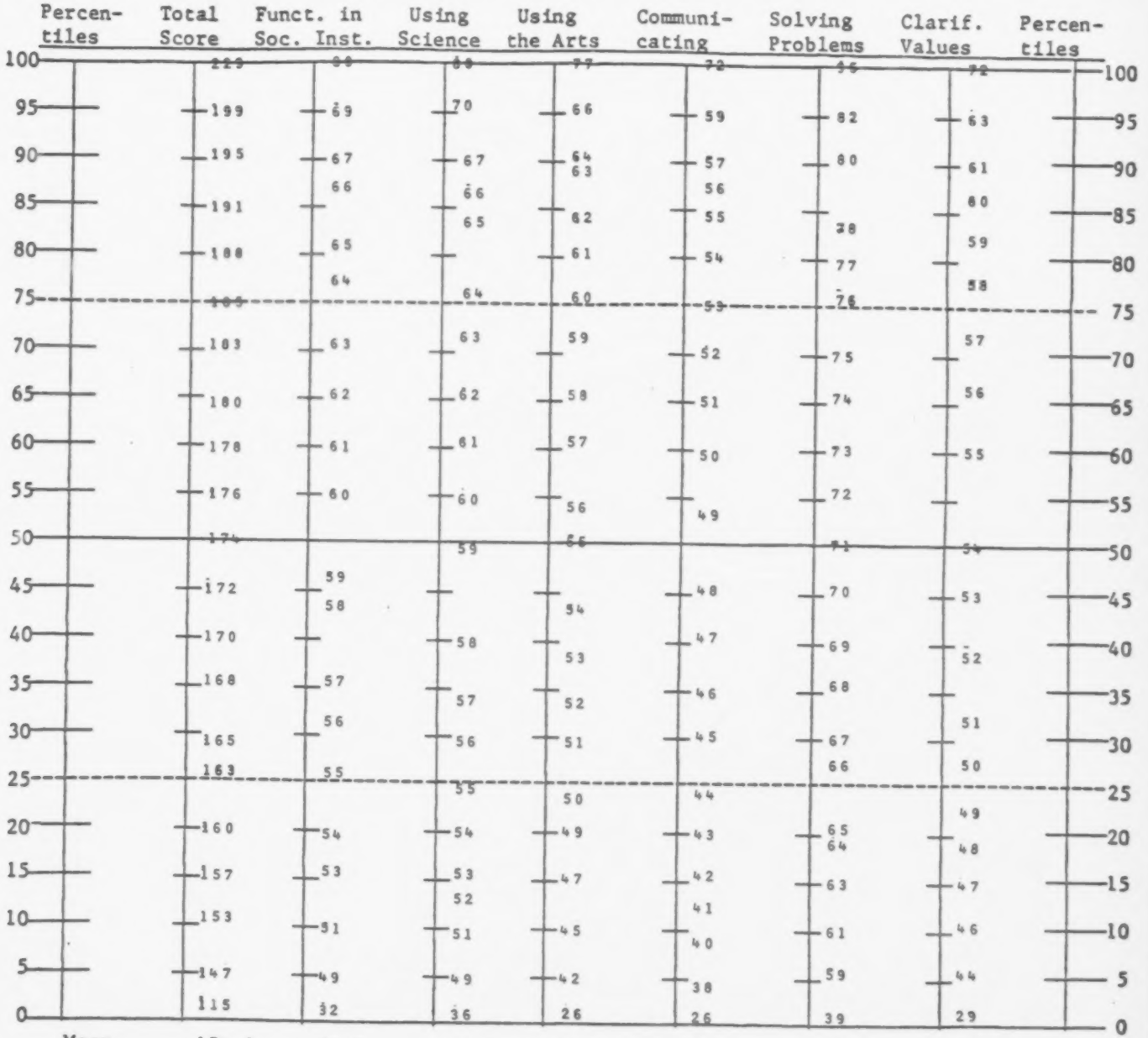
| Percentiles | Total Score | Funct. in Soc. Inst. | Using Science | Using the Arts | Communicating | Solving Problems | Clarif. Values | Percentiles |
|---|---|---|---|---|---|---|---|---|
| 100 | 209 | 70 | 73 | 70 | 58 | 87 | 66 | 100 |
| 95 | 194 | 67 | 68 67 | 67 | 57 | 82 | 63 62 | 95 |
| 90 | 190 | 66 | 66 | 65 64 | 56 55 | 79 77 | 61 60 | 90 |
| 85 | 189 188 | 65 64 | 65 64 | 63 | 54 | 76 | 59 | 85 |
| 80 | 187 186 | 63 | 63 | 61 | 63 | 75 | 58 | 80 |
| 75 | 184 | 62 | 62 | 60 | 63 | 73 | 57 | 75 |
| 70 | 182 181 | 61 | 60 | 59 | 52 | 72 | 56 | 70 |
| 65 | 180 | 60 | 59 | 57 | 51 | 70 | 55 | 65 |
| 60 | 178 176 175 | 59 | 58 | 56 | 50 | 69 68 | 54 | 60 |
| 55 | 174 | 58 | 57 | 55 | 49 | 66 | 53 52 | 55 |
| 50 | 173 172 | 57 | 56 | 54 | 48 | 65 64 | 51 50 | 50 |
| 45 | 171 | 56 | 55 | 52 | 47 | 62 61 | 49 48 | 45 |
| 40 | 170 167 | 55 54 | 54 | 51 | 46 | 59 58 | 47 46 | 40 |
| 35 | 166 165 | 53 52 | 53 52 | 50 48 | 45 44 | 57 56 | 45 44 | 35 |
| 30 | 161 163 162 | 51 50 | 51 50 | 47 46 | 43 42 | 54 53 | 43 42 | 30 |
| 25 | 159 | 49 48 | 49 48 | 45 44 | 41 40 | 52 51 | 41 40 | 25 |
| 20 | 157 | 47 46 | 47 46 | 43 42 | 39 38 | 50 49 | 39 38 | 20 |
| 15 | 151 | 45 44 | 45 44 | 41 40 | 37 36 | 48 47 | 37 36 | 15 |
| 10 | 145 | 43 42 | 43 42 | 39 38 | 35 34 | 46 45 | 35 34 | 10 |
| 5 | 130 | 41 40 | 41 40 | 37 36 | 33 32 | 43 42 | 33 32 | 5 |
| 0 | 120 | 40 | 37 | 30 | 36 | 40 | 40 | 0 |

12

Table 2

## 1984 COMP Entering Freshmen Reference Group Norms
Based on 14,048 Freshmen at 61 Institutions

Directions: Circle the place where your score falls on each scale. Refer to the Percentiles to judge your performance compared to the others in the Freshmen Reference Group. (For example, if your total score was 173, you scored above almost 50% of those in this comparison group.)




Description of the 14,048 Freshmen in the 1984 Reference Group.

40% Men
60% Women

Area of Interest
44% Social Sciences
34% Natural Sciences
22% Arts/Humanities

Age Range
92% Age 19 or below
4% Age 20-22
2% Age 23-30
1% Over 30

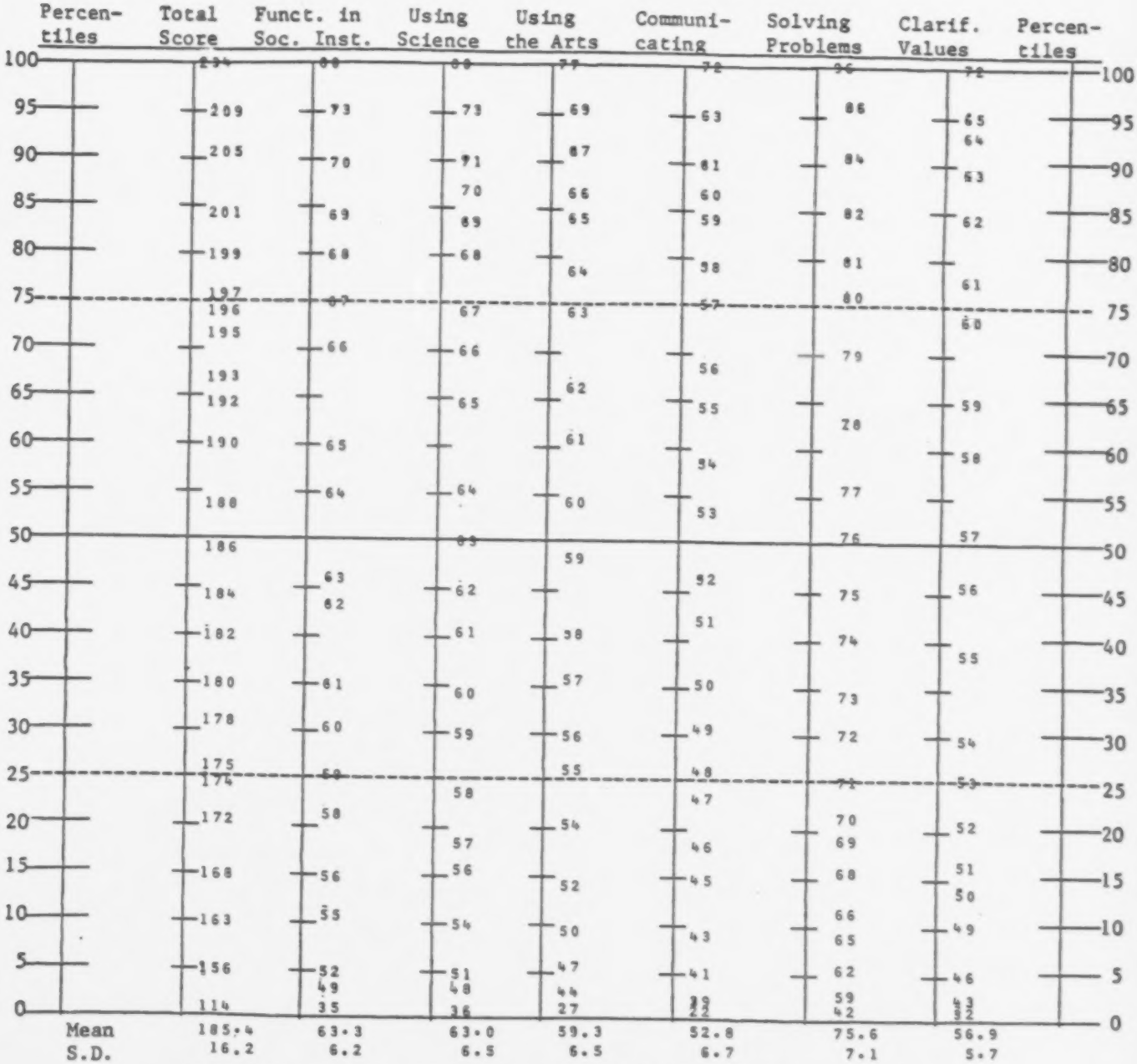
ACT Composite (or equivalent for SAT Total) scores available for 11,357 Freshmen. Mean 20.6

ACT Composite Range
2% below 10
5% 10-12
11% 13-15
16% 16-18
22% 19-21
20% 22-24
16% 25-27
9% 28-30
1% over 30

Table 3

1984 COMP Senior Reference Group Norms
Based on 18,568 Seniors at 94 Institutions

Directions: Circle the place where your score falls on each scale. Refer to the Percentiles to judge your performance compared to Seniors in the Reference Group. (For example, if your total score was 186, you scored above almost 50% of those in this comparison group.)




Description of the 18,568 Seniors in the 1984 Reference Group.

45% Men
55% Women

Area of Interest
49% Social Sciences
29% Natural Sciences
22% Arts/Humanities

Age Range
1% Age 19 or below
59% Age 20-22
29% Age 23-30
11% Over 30

ACT Composite (or equivalent for SAT Total) scores available for 11,163 Seniors. Mean 21.0

ACT Composite Range
2% below 10
6% 10-12
10% 13-15
14% 16-18
18% 19-21
20% 22-24
18% 25-27
10% 28-30
2% over 30

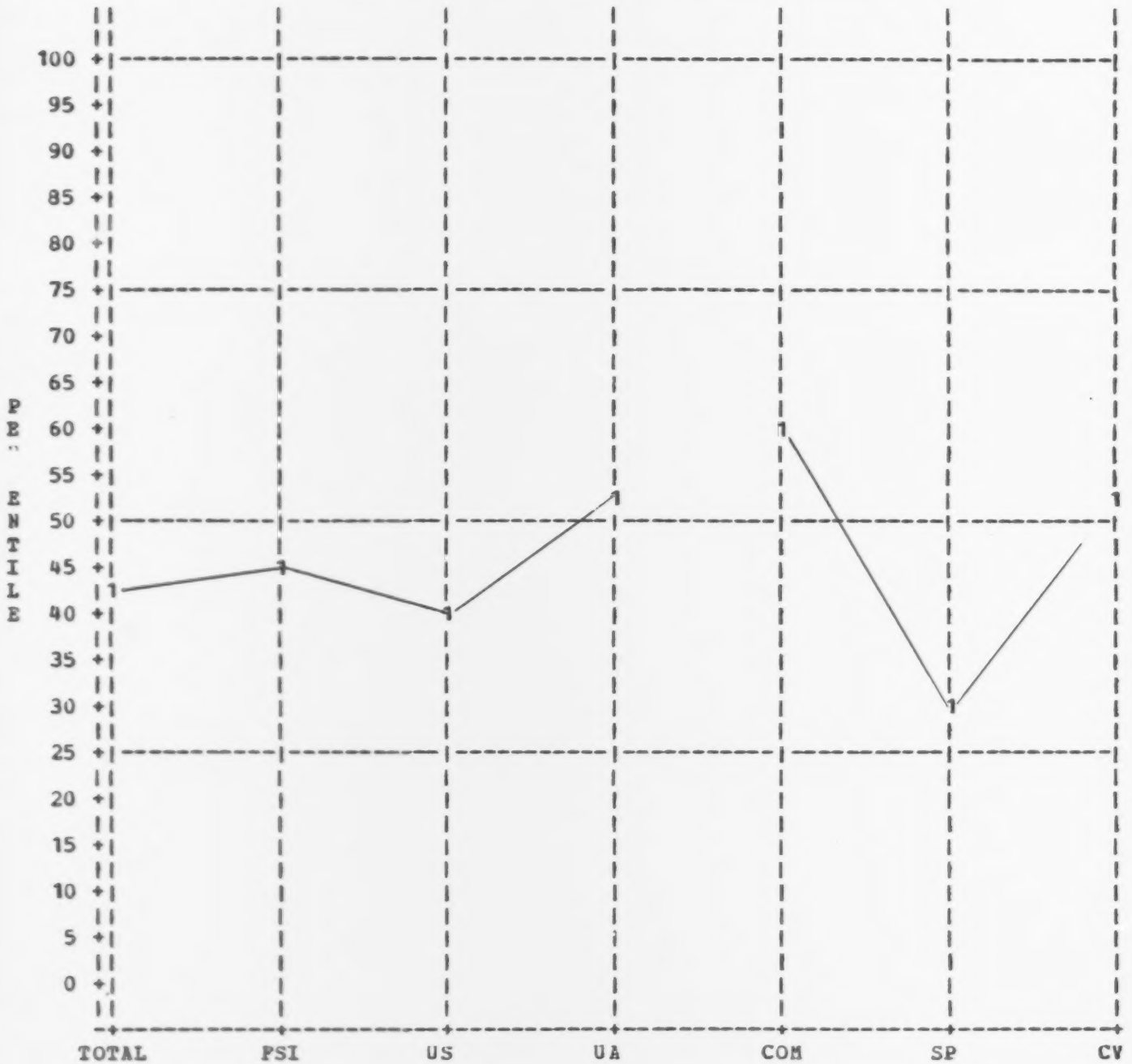
14

Table 4

COMP RESULTS PROFILED ON ENTERING FRESHMAN REFERENCE GROUP NORMS
BASED ON PERCENTILES FOR 14,048 FRESHMAN AT 61 INSTITUTIONS
19:41 MONDAY, DECEMBER 17, 1984
PLOT OF PCTILE * SCALES SYMBOL IS VALUE FOR GRADE LEVEL
1=FRESHMEN 2=SOPHOMORE 3=JUNIORS 4=SENIORS
N=141

INST=TRENTON STATE C

PLOT OF Y*X SYMBOL IS VALUE OF GRADE




SUBTESTS 1-6 AND TOTAL SCORE

15

COMP RESULTS PROFILED ON ENTERING FRESHMAN REFERENCE GROUP NORMS
BASED ON PERCENTILES FOR 14,048 FRESHMAN AT 61 INSTITUTIONS
19:41 MONDAY, DECEMBER 17, 1984
PLOT OF PCTILE * SCALES SYMBOL IS VALUE FOR GRADE LEVEL
1=FRESHMEN 2=SOPHOMORE 3=JUNIORS 4=SENIORS

---------- INST=TRENTON STATE C ----------

| OBS | TYPE | INST | IDD | TT | NCNT | GRLVL1 | CODE | X | Y | ACTE | N_ACT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | TRENTON STATE C | 818 | 16 | 144 | 1 | 1 | TOTAL | 42.14 | 23.09 | 133 |
| 2 | 1 | TRENTON STATE C | 818 | 16 | 144 | 1 | 1 | PSI | 43.83 | 23.09 | 133 |
| 3 | 1 | TRENTON STATE C | 818 | 16 | 144 | 1 | 1 | US | 39.90 | 23.09 | 133 |
| 4 | 1 | TRENTON STATE C | 818 | 16 | 144 | 1 | 1 | UA | 53.19 | 23.09 | 133 |
| 5 | 1 | TRENTON STATE C | 818 | 16 | 144 | 1 | 1 | COM | 60.07 | 23.09 | 133 |
| 6 | 1 | TRENTON STATE C | 818 | 16 | 144 | 1 | 1 | SP | 31.22 | 23.09 | 133 |
| 7 | 1 | TRENTON STATE C | 818 | 16 | 144 | 1 | 1 | CV | 53.50 | 23.09 | 133 |

Table 5

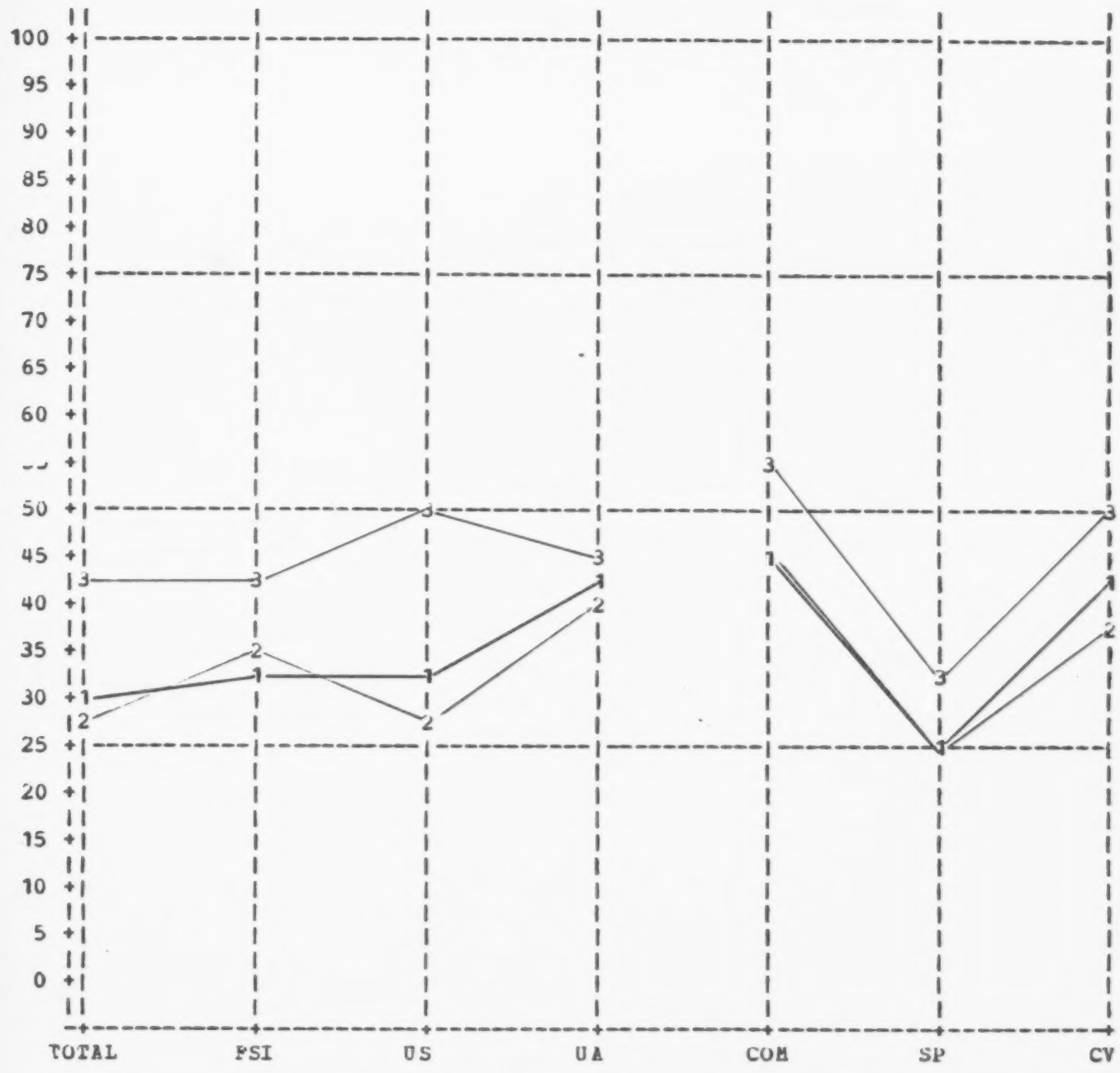
COMP RESULTS PROFILED ON SENIOR REFERENCE GROUP NORMS
BASED ON PERCENTILES FOR 18,568 SENIORS AT 94 INSTITUTIONS
19:41 MONDAY, DECEMBER 17, 1984

PLOT OF PCTILE * SCALES SYMBOL IS VALUE FOR CATEGORY1

0= 1=Type I N=32 2=Type II N=31 3=Type III N=5 4=
5= 6= 7= 8= 9=

INST=TRENTON STATE C

PLOT OF Y*X SYMBOL IS VALUE OF CATEGOR1




SUBTESTS 1-6 AND TOTAL SCORE

NOTE: 2 OBS HIDDEN

16

COMP RESULTS PROFILED ON SENIOR REFERENCE GROUP NORMS
BASED ON PERCENTILES FOR 18,568 SENIORS AT 94 INSTITUTIONS
19:41 MONDAY, DECEMBER 17, 1984
PLOT OF PCTILE * SCALES SYMBOL IS VALUE FOR CATEGORY1

0= 1= 2= 3= 4=
5= 6= 7= 8= 9=

---------- INST=TRENTON STATE C ----------

| OBS | TYPE | INST | IDD | TT | NCNT | GRLVL1 | CODE | X | Y | ACTE | N_ACT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3 | TRENTON STATE C | 818 | 16 | 32 | 4 | 1 | TOTAL | 29.26 | 21.43 | 32 |
| 2 | 3 | TRENTON STATE C | 818 | 16 | 31 | 4 | 2 | TOTAL | 28.45 | 0.00 | 0 |
| 3 | 3 | TRENTON STATE C | 818 | 16 | 5 | 4 | 3 | TOTAL | 41.71 | 0.00 | 0 |
| 4 | 3 | TRENTON STATE C | 818 | 16 | 32 | 4 | 1 | FSI | 31.43 | 21.43 | 32 |
| 5 | 3 | TRENTON STATE C | 818 | 16 | 31 | 4 | 2 | FSI | 35.86 | 0.00 | 0 |
| 6 | 3 | TRENTON STATE C | 818 | 16 | 5 | 4 | 3 | FSI | 42.60 | 0.00 | 0 |
| 7 | 3 | TRENTON STATE C | 818 | 16 | 32 | 4 | 1 | US | 32.70 | 21.43 | 32 |
| 8 | 3 | TRENTON STATE C | 818 | 16 | 31 | 4 | 2 | US | 27.89 | 0.00 | 0 |
| 9 | 3 | TRENTON STATE C | 818 | 16 | 5 | 4 | 3 | US | 49.09 | 0.00 | 0 |
| 10 | 3 | TRENTON STATE C | 818 | 16 | 32 | 4 | 1 | UA | 42.58 | 21.43 | 32 |
| 11 | 3 | TRENTON STATE C | 818 | 16 | 31 | 4 | 2 | UA | 39.21 | 0.00 | 0 |
| 12 | 3 | TRENTON STATE C | 818 | 16 | 5 | 4 | 3 | UA | 45.17 | 0.00 | 0 |
| 13 | 3 | TRENTON STATE C | 818 | 16 | 32 | 4 | 1 | COM | 44.88 | 21.43 | 32 |
| 14 | 3 | TRENTON STATE C | 818 | 16 | 31 | 4 | 2 | COM | 45.89 | 0.00 | 0 |
| 15 | 3 | TRENTON STATE C | 818 | 16 | 5 | 4 | 3 | COM | 54.17 | 0.00 | 0 |
| 16 | 3 | TRENTON STATE C | 818 | 16 | 32 | 4 | 1 | SP | 23.85 | 21.43 | 32 |
| 17 | 3 | TRENTON STATE C | 818 | 16 | 31 | 4 | 2 | SP | 24.59 | 0.00 | 0 |
| 18 | 3 | TRENTON STATE C | 818 | 16 | 5 | 4 | 3 | SP | 32.67 | 0.00 | 0 |
| 19 | 3 | TRENTON STATE C | 818 | 16 | 32 | 4 | 1 | CV | 41.31 | 21.43 | 32 |
| 20 | 3 | TRENTON STATE C | 818 | 16 | 31 | 4 | 2 | CV | 37.15 | 0.00 | 0 |
| 21 | 3 | TRENTON STATE C | 818 | 16 | 5 | 4 | 3 | CV | 50.80 | 0.00 | 0 |

Table 6

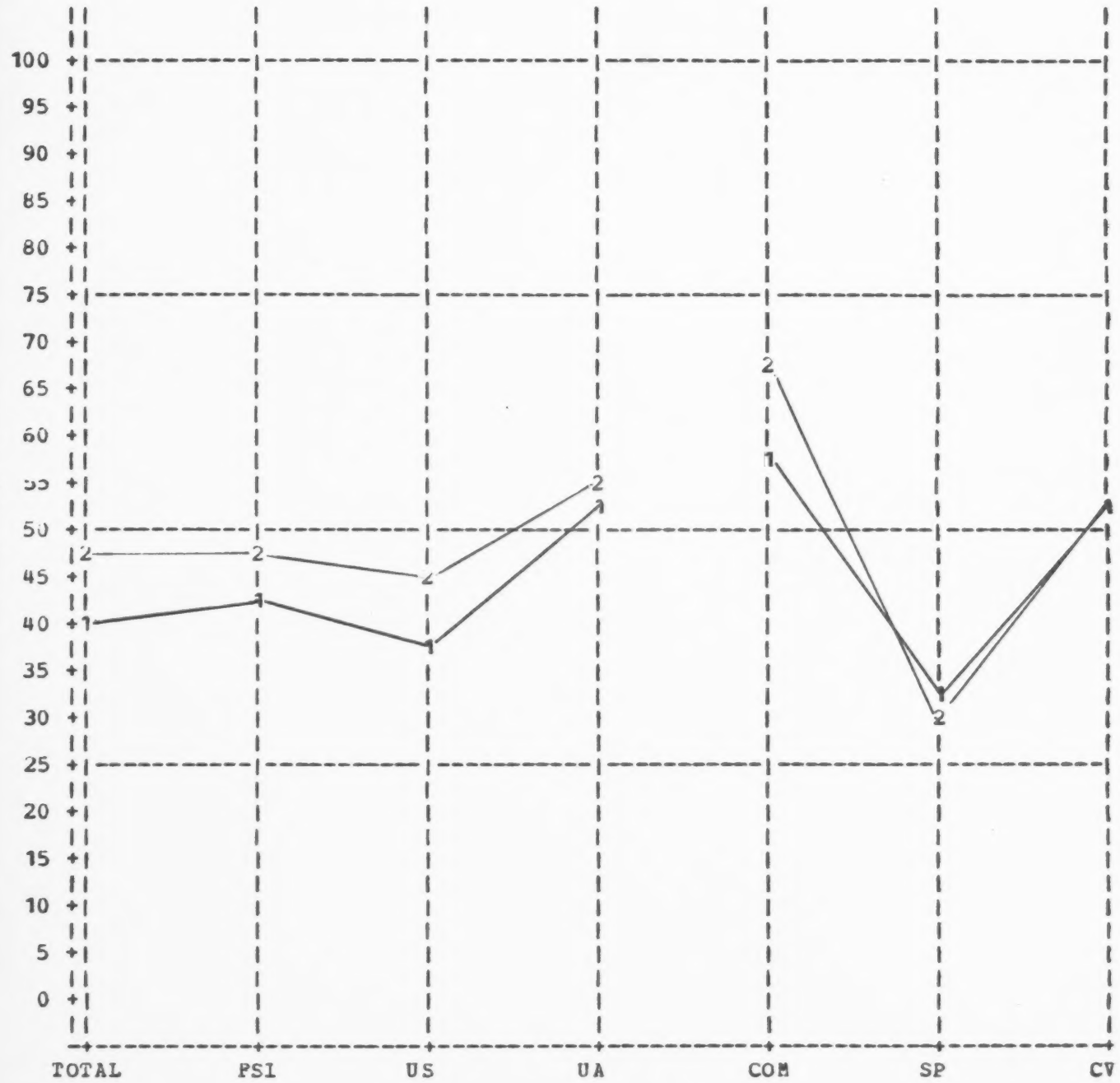
COMP RESULTS PROFILED ON ENTERING FRESHMAN REFERENCE GROUP NORMS
BASED ON PERCENTILES FOR 14,048 FRESHMAN AT 61 INSTITUTIONS
19:41 MONDAY, DECEMBER 17, 1984

PLOT OF PCTILE * SCALES SYMBOL IS VALUE FOR SEX

1=FEMALE 2=MALE
N=100 N=71

INST=TRENTON STATE C

PLOT OF Y*X SYMBOL IS VALUE OF SEX




SUBTESTS 1-6 AND TOTAL SCORE

NOTE: 1 OBS HIDDEN



17

COMP RESULTS PROFILED ON ENTERING FRESHMAN REFERENCE GROUP NORMS
BASED ON PERCENTILES FOR 14,048 FRESHMAN AT 61 INSTITUTIONS
19:41 MONDAY, DECEMBER 17, 1984
PLOT OF PCTILE * SCALES SYMBOL IS VALUE FOR SEX
1=FEMALE 2=MALE

---------- INST=TRENTON STATE C ----------

| OBS | TYPE | INST | IDD | TT | NCNT | GRLVL1 | CODE | X | Y | ACTE | N_ACT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6 | TRENTON STATE C | 818 | 16 | 100 | 1 | 1 | TOTAL | 40.06 | 22.73 | 95 |
| 2 | 6 | TRENTON STATE C | 818 | 16 | 44 | 1 | 2 | TOTAL | 46.46 | 23.97 | 38 |
| 3 | 6 | TRENTON STATE C | 818 | 16 | 100 | 1 | 1 | FSI | 41.67 | 22.73 | 95 |
| 4 | 6 | TRENTON STATE C | 818 | 16 | 44 | 1 | 2 | FSI | 48.52 | 23.97 | 38 |
| 5 | 6 | TRENTON STATE C | 818 | 16 | 100 | 1 | 1 | US | 38.40 | 22.73 | 95 |
| 6 | 6 | TRENTON STATE C | 818 | 16 | 44 | 1 | 2 | US | 44.50 | 23.97 | 38 |
| 7 | 6 | TRENTON STATE C | 818 | 16 | 100 | 1 | 1 | UA | 52.88 | 22.73 | 95 |
| 8 | 6 | TRENTON STATE C | 818 | 16 | 44 | 1 | 2 | UA | 53.90 | 23.97 | 38 |
| 9 | 6 | TRENTON STATE C | 818 | 16 | 100 | 1 | 1 | COM | 56.61 | 22.73 | 95 |
| 10 | 6 | TRENTON STATE C | 818 | 16 | 44 | 1 | 2 | COM | 67.98 | 23.97 | 38 |
| 11 | 6 | TRENTON STATE C | 818 | 16 | 100 | 1 | 1 | SP | 31.76 | 22.73 | 95 |
| 12 | 6 | TRENTON STATE C | 818 | 16 | 44 | 1 | 2 | SP | 30.00 | 23.97 | 38 |
| 13 | 6 | TRENTON STATE C | 818 | 16 | 100 | 1 | 1 | CV | 53.39 | 22.73 | 95 |
| 14 | 6 | TRENTON STATE C | 818 | 16 | 44 | 1 | 2 | CV | 53.74 | 23.97 | 38 |

17A

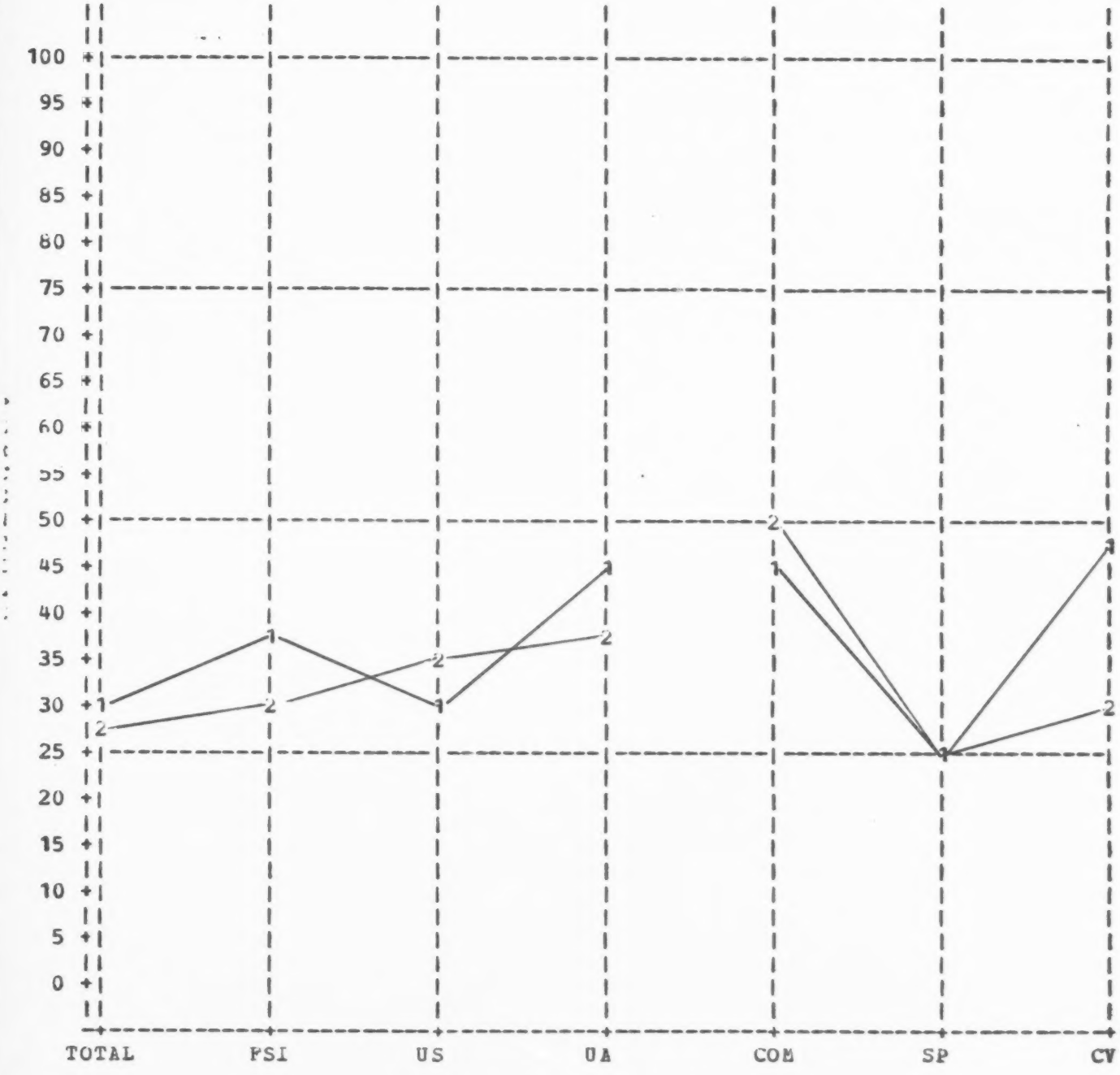
Table 7

COMP RESULTS PROFILED ON SENIOR REFERENCE GROUP NORMS
BASED ON PERCENTILES FOR 18,508 SENIORS AT 94 INSTITUTIONS
19:41 MONDAY, DECEMBER 17, 1984

PLOT OF PCTILE * SCALES SYMBOL IS VALUE FOR SEX
1=FEMALE 2=MALE
N=39 N=39

INST=TRENTON STATE C

PLOT OF Y*X SYMBOL IS VALUE OF SEX




SUBTESTS 1-6 AND TOTAL SCORE

NOTE: 1 OBS HIDDEN

18

COMP RESULTS PROFILED ON SENIOR REFERENCE GROUP NORMS
BASED ON PERCENTILES FOR 18,568 SENIORS AT 94 INSTITUTIONS
19:41 MONDAY, DECEMBER 17, 1984
PLOT OF PCTILE * SCALES SYMBOL IS VALUE FOR SEX
1=FEMALE 2=MALE

INST=TRENTON STATE C

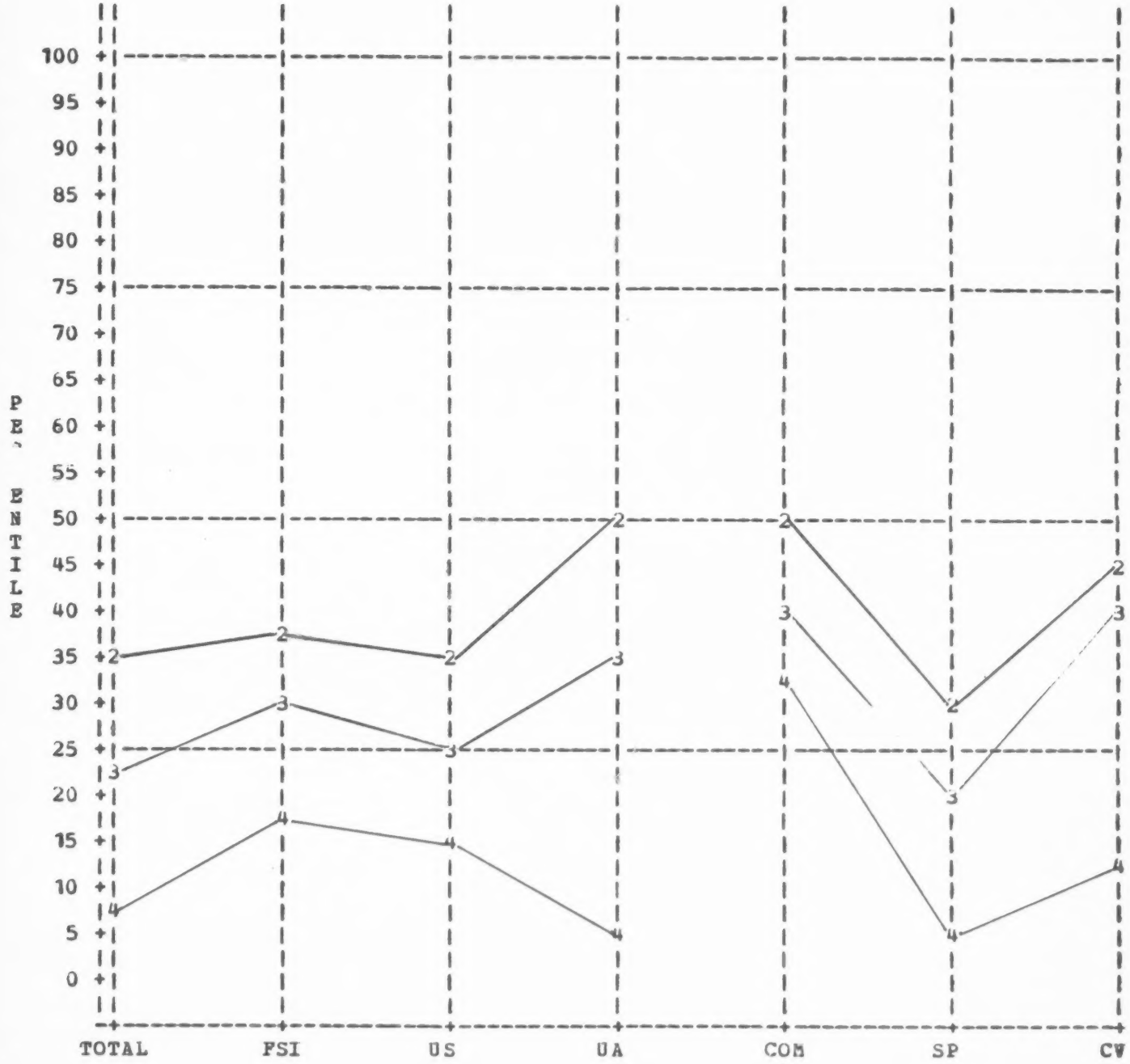
| OBS | TYPE | INST | IDD | TT | NCNT | GRLVL1 | CODE | X | Y | ACTE | N_ACT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6 | TRENTON STATE C | 818 | 16 | 39 | 4 | 1 | TOTAL | 30.41 | 20.47 | 17 |
| 2 | 6 | TRENTON STATE C | 818 | 16 | 29 | 4 | 2 | TOTAL | 28.74 | 22.53 | 15 |
| 3 | 6 | TRENTON STATE C | 818 | 16 | 39 | 4 | 1 | FSI | 36.50 | 20.47 | 17 |
| 4 | 6 | TRENTON STATE C | 818 | 16 | 29 | 4 | 2 | FSI | 31.18 | 22.53 | 15 |
| 5 | 6 | TRENTON STATE C | 818 | 16 | 39 | 4 | 1 | US | 29.22 | 20.47 | 17 |
| 6 | 6 | TRENTON STATE C | 818 | 16 | 29 | 4 | 2 | US | 35.20 | 22.53 | 15 |
| 7 | 6 | TRENTON STATE C | 818 | 16 | 39 | 4 | 1 | UA | 44.58 | 20.47 | 17 |
| 8 | 6 | TRENTON STATE C | 818 | 16 | 29 | 4 | 2 | UA | 37.26 | 22.53 | 15 |
| 9 | 6 | TRENTON STATE C | 818 | 16 | 39 | 4 | 1 | COM | 43.96 | 20.47 | 17 |
| 10 | 6 | TRENTON STATE C | 818 | 16 | 29 | 4 | 2 | COM | 49.27 | 22.53 | 15 |
| 11 | 6 | TRENTON STATE C | 818 | 16 | 39 | 4 | 1 | SP | 24.84 | 20.47 | 17 |
| 12 | 6 | TRENTON STATE C | 818 | 16 | 29 | 4 | 2 | SP | 24.43 | 22.53 | 15 |
| 13 | 6 | TRENTON STATE C | 818 | 16 | 39 | 4 | 1 | CV | 46.74 | 20.47 | 17 |
| 14 | 6 | TRENTON STATE C | 818 | 16 | 29 | 4 | 2 | CV | 30.99 | 22.53 | 15 |

Table 5

COMP RESULTS PROFILED ON SENIOR REFERENCE GROUP NORMS
BASED ON PERCENTILES FOR 18,568 SENIORS AT 94 INSTITUTIONS
19:41 MONDAY, DECEMBER 17, 1984

PLOT OF PCTILE * SCALES SYMBOL IS VALUE FOR AGE
1=UNDER 20 2=20-22 (N=50) 3=23-30 (N=13) 4=OVER 30 (N=5)
INST=TRENTON STATE C

PLOT OF Y*X SYMBOL IS VALUE OF AGE




SUBTESTS 1-6 AND TOTAL SCORE

19

COMP RESULTS PROFILED ON SENIOR REFERENCE GROUP NORMS
BASED ON PERCENTILES FOR 18,568 SENIORS AT 94 INSTITUTIONS
19:41 MONDAY, DECEMBER 17, 1984
PLOT OF PCTILE * SCALES SYMBOL IS VALUE FOR AGE
1=UNDER 20 2=20-22 3=23-30 4=OVER 30

INST=TRENTON STATE C

| OBS | TYPE | INST | IDD | TT | NCNT | GRLVL1 | CODE | X | Y | ACTE | N_ACT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5 | TRENTON STATE C | 818 | 16 | 50 | 4 | 2 | TOTAL | 34.76 | 21.73 | 30 |
| 2 | 5 | TRENTON STATE C | 818 | 16 | 13 | 4 | 3 | TOTAL | 23.70 | 17.00 | 2 |
| 3 | 5 | TRENTON STATE C | 818 | 16 | 5 | 4 | 4 | TOTAL | 7.45 | 0.00 | 0 |
| 4 | 5 | TRENTON STATE C | 818 | 16 | 50 | 4 | 2 | FSI | 37.27 | 21.73 | 30 |
| 5 | 5 | TRENTON STATE C | 818 | 16 | 13 | 4 | 3 | FSI | 29.82 | 17.00 | 2 |
| 6 | 5 | TRENTON STATE C | 818 | 16 | 5 | 4 | 4 | FSI | 18.65 | 0.00 | 0 |
| 7 | 5 | TRENTON STATE C | 818 | 16 | 50 | 4 | 2 | US | 34.90 | 21.73 | 30 |
| 8 | 5 | TRENTON STATE C | 818 | 16 | 13 | 4 | 3 | US | 25.88 | 17.00 | 2 |
| 9 | 5 | TRENTON STATE C | 818 | 16 | 5 | 4 | 4 | US | 14.81 | 0.00 | 0 |
| 10 | 5 | TRENTON STATE C | 818 | 16 | 50 | 4 | 2 | UA | 49.98 | 21.73 | 30 |
| 11 | 5 | TRENTON STATE C | 818 | 16 | 13 | 4 | 3 | UA | 34.01 | 17.00 | 2 |
| 12 | 5 | TRENTON STATE C | 818 | 16 | 5 | 4 | 4 | UA | 5.55 | 0.00 | 0 |
| 13 | 5 | TRENTON STATE C | 818 | 16 | 50 | 4 | 2 | COM | 49.31 | 21.73 | 30 |
| 14 | 5 | TRENTON STATE C | 818 | 16 | 13 | 4 | 3 | COM | 39.92 | 17.00 | 2 |
| 15 | 5 | TRENTON STATE C | 818 | 16 | 5 | 4 | 4 | COM | 32.99 | 0.00 | 0 |
| 16 | 5 | TRENTON STATE C | 818 | 16 | 50 | 4 | 2 | SP | 30.19 | 21.73 | 30 |
| 17 | 5 | TRENTON STATE C | 818 | 16 | 13 | 4 | 3 | SP | 19.71 | 17.00 | 2 |
| 18 | 5 | TRENTON STATE C | 818 | 16 | 5 | 4 | 4 | SP | 5.01 | 0.00 | 0 |
| 19 | 5 | TRENTON STATE C | 818 | 16 | 50 | 4 | 2 | CV | 44.91 | 21.73 | 30 |
| 20 | 5 | TRENTON STATE C | 818 | 16 | 13 | 4 | 3 | CV | 39.09 | 17.00 | 2 |
| 21 | 5 | TRENTON STATE C | 818 | 16 | 5 | 4 | 4 | CV | 12.67 | 0.00 | 0 |

Table 9

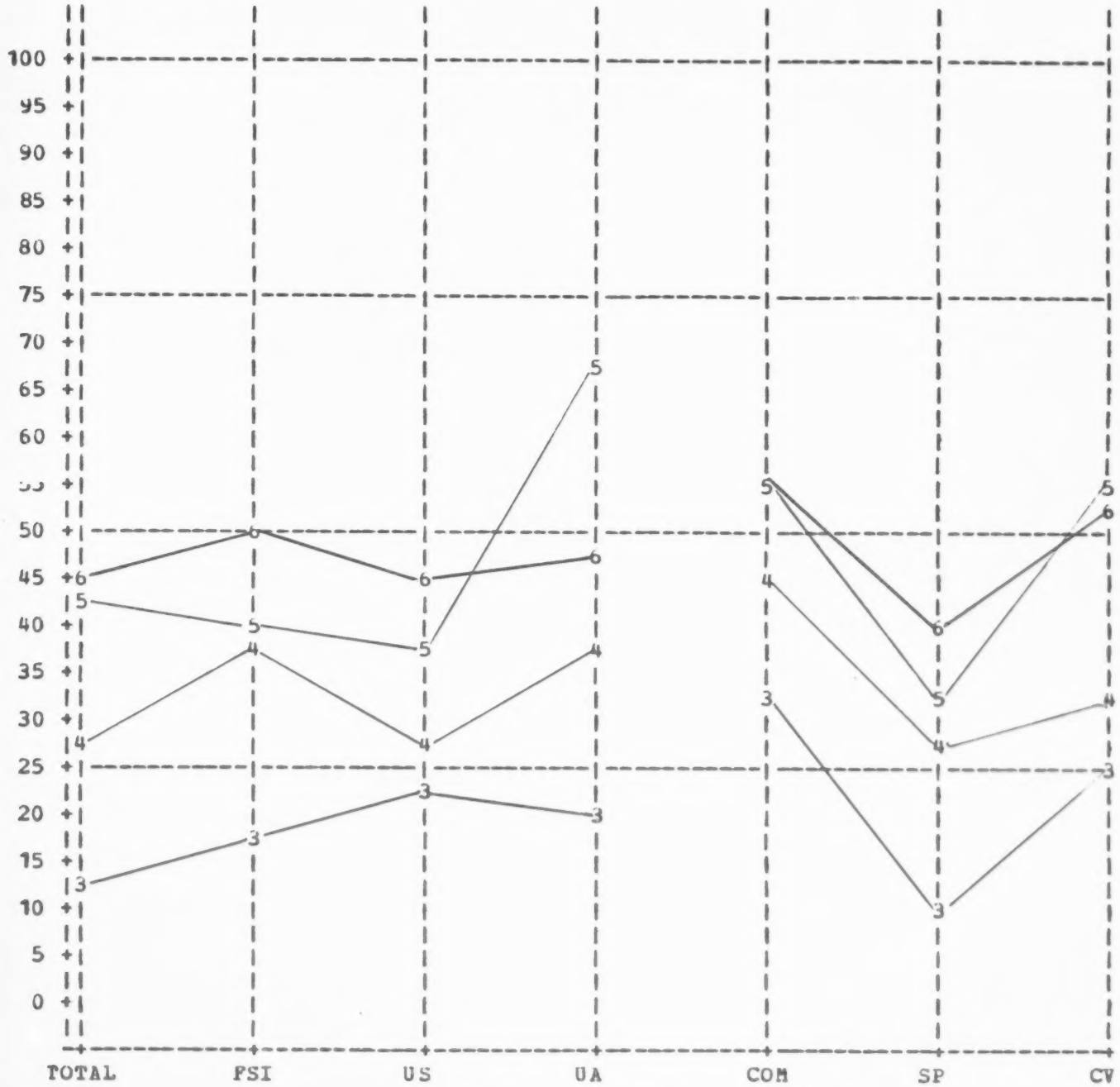
COMP RESULTS PROFILED ON SENIOR REFERENCE GROUP NORMS
BASED ON PERCENTILES FOR 18,568 SENIORS AT 94 INSTITUTIONS
19:41 MONDAY, DECEMBER 17, 1984

PLOT OF PCTILE * SCALES SYMBOL IS VALUE FOR GPA GROUP
1=UNDER 1.49 2=1.5-1.99 3=2.-2.49 4=2.5-2.99 5=3.-3.49 6=OVER 3.5

N=15

INST=TRENTON STATE C

PLOT OF Y*X SYMBOL IS VALUE OF GPA




SUBTESTS 1-6 AND TOTAL SCORE

NOTE: 1 OBS HIDDEN

COMP RESULTS PROFILED ON SENIOR REFERENCE GROUP NORMS
BASED ON PERCENTILES FOR 18,568 SENIORS AT 94 INSTITUTIONS
19:41 MONDAY, DECEMBER 17, 1984
PLOT OF PCTILE * SCALES SYMBOL IS VALUE FOR GPA GROUP
1=UNDER 1.49 2=1.5-1.99 3=2.-2.49 4=2.5-2.99 5=3.-3.49 6=OVER 3.5

INST=TRENTON STATE C

| OBS | TYPE | INST | IDD | TT | NCNT | GRLVL1 | CODE | X | Y | ACTE | N_ACT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 7 | TRENTON STATE C | 818 | 16 | 15 | 4 | 3 | TOTAL | 13.43 | 17.59 | 5 |
| 2 | 7 | TRENTON STATE C | 818 | 16 | 24 | 4 | 4 | TOTAL | 27.30 | 21.69 | 13 |
| 3 | 7 | TRENTON STATE C | 818 | 16 | 17 | 4 | 5 | TOTAL | 42.20 | 21.89 | 10 |
| 4 | 7 | TRENTON STATE C | 818 | 16 | 12 | 4 | 6 | TOTAL | 45.29 | 24.25 | 4 |
| 5 | 7 | TRENTON STATE C | 818 | 16 | 15 | 4 | 3 | FSI | 16.57 | 17.59 | 5 |
| 6 | 7 | TRENTON STATE C | 818 | 16 | 24 | 4 | 4 | FSI | 36.30 | 21.69 | 13 |
| 7 | 7 | TRENTON STATE C | 818 | 16 | 17 | 4 | 5 | FSI | 39.63 | 21.89 | 10 |
| 8 | 7 | TRENTON STATE C | 818 | 16 | 12 | 4 | 6 | FSI | 50.36 | 24.25 | 4 |
| 9 | 7 | TRENTON STATE C | 818 | 16 | 15 | 4 | 3 | US | 22.81 | 17.59 | 5 |
| 10 | 7 | TRENTON STATE C | 818 | 16 | 24 | 4 | 4 | US | 26.60 | 21.69 | 13 |
| 11 | 7 | TRENTON STATE C | 818 | 16 | 17 | 4 | 5 | US | 36.29 | 21.89 | 10 |
| 12 | 7 | TRENTON STATE C | 818 | 16 | 12 | 4 | 6 | US | 44.70 | 24.25 | 4 |
| 13 | 7 | TRENTON STATE C | 818 | 16 | 15 | 4 | 3 | UA | 19.95 | 17.59 | 5 |
| 14 | 7 | TRENTON STATE C | 818 | 16 | 24 | 4 | 4 | UA | 36.68 | 21.69 | 13 |
| 15 | 7 | TRENTON STATE C | 818 | 16 | 17 | 4 | 5 | UA | 68.01 | 21.89 | 10 |
| 16 | 7 | TRENTON STATE C | 818 | 16 | 12 | 4 | 6 | UA | 48.38 | 24.25 | 4 |
| 17 | 7 | TRENTON STATE C | 818 | 16 | 15 | 4 | 3 | COM | 32.99 | 17.59 | 5 |
| 18 | 7 | TRENTON STATE C | 818 | 16 | 24 | 4 | 4 | COM | 44.73 | 21.69 | 13 |
| 19 | 7 | TRENTON STATE C | 818 | 16 | 17 | 4 | 5 | COM | 54.64 | 21.89 | 10 |
| 20 | 7 | TRENTON STATE C | 818 | 16 | 12 | 4 | 6 | COM | 55.24 | 24.25 | 4 |
| 21 | 7 | TRENTON STATE C | 818 | 16 | 15 | 4 | 3 | SP | 9.51 | 17.59 | 5 |
| 22 | 7 | TRENTON STATE C | 818 | 16 | 24 | 4 | 4 | SP | 27.27 | 21.69 | 13 |
| 23 | 7 | TRENTON STATE C | 818 | 16 | 17 | 4 | 5 | SP | 31.74 | 21.89 | 10 |
| 24 | 7 | TRENTON STATE C | 818 | 16 | 12 | 4 | 6 | SP | 39.79 | 24.25 | 4 |
| 25 | 7 | TRENTON STATE C | 818 | 16 | 15 | 4 | 3 | CV | 25.77 | 17.59 | 5 |
| 26 | 7 | TRENTON STATE C | 818 | 16 | 24 | 4 | 4 | CV | 31.80 | 21.69 | 13 |
| 27 | 7 | TRENTON STATE C | 818 | 16 | 17 | 4 | 5 | CV | 54.21 | 21.89 | 10 |
| 28 | 7 | TRENTON STATE C | 818 | 16 | 12 | 4 | 6 | CV | 52.87 | 24.25 | 4 |

20 A

Table 10

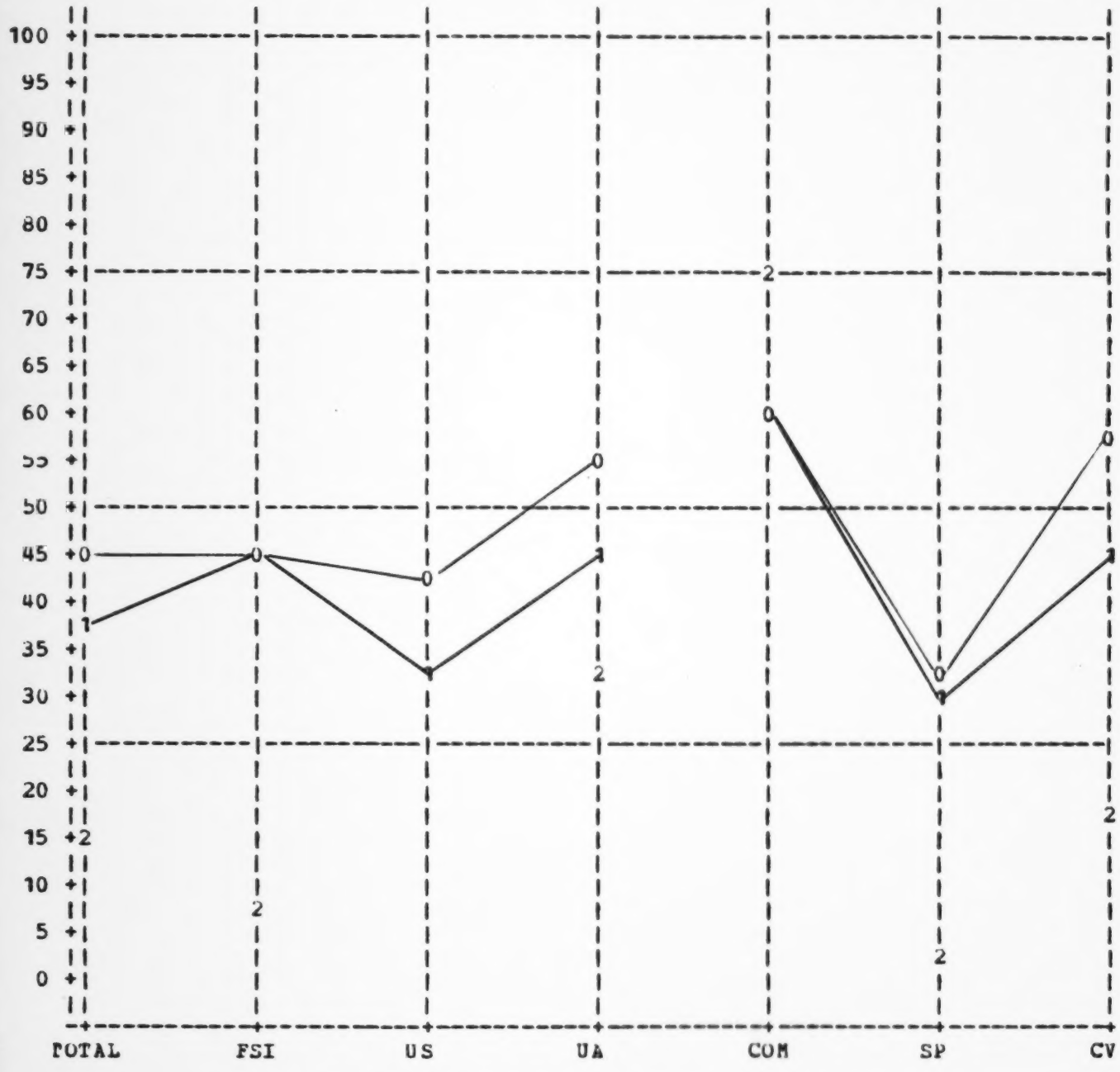
COMP RESULTS PROFILED ON ENTERING FRESHMAN REFERENCE GROUP NORMS
BASED ON PERCENTILES FOR 14,048 FRESHMAN AT 61 INSTITUTIONS
19:41 MONDAY, DECEMBER 17, 1984

PLOT OF PCTILE * SCALES SYMBOL IS VALUE FOR CATEGORY2

0=Orth... Fr. N=... 1=Matched Fr N=32 2= 3= 4=
5= 6= 7= 8= 9=

INST=TRENTON STATE C

PLOT OF Y*X SYMBOL IS VALUE OF CATEGOR2




SUBTESTS 1-6 AND TOTAL SCORE

NOTE: 3 OBS HIDDEN

COMP RESULTS PROFILED ON ENTERING FRESHMAN REFERENCE GROUP NORMS
BASED ON PERCENTILES FOR 14,048 FRESHMAN AT 61 INSTITUTIONS
19:41 MONDAY, DECEMBER 17, 1984
PLOT OF PCTILE * SCALES SYMBOL IS VALUE FOR CATEGORY2

0= 1= 2= 3= 4=
5= 6= 7= 8= 9=

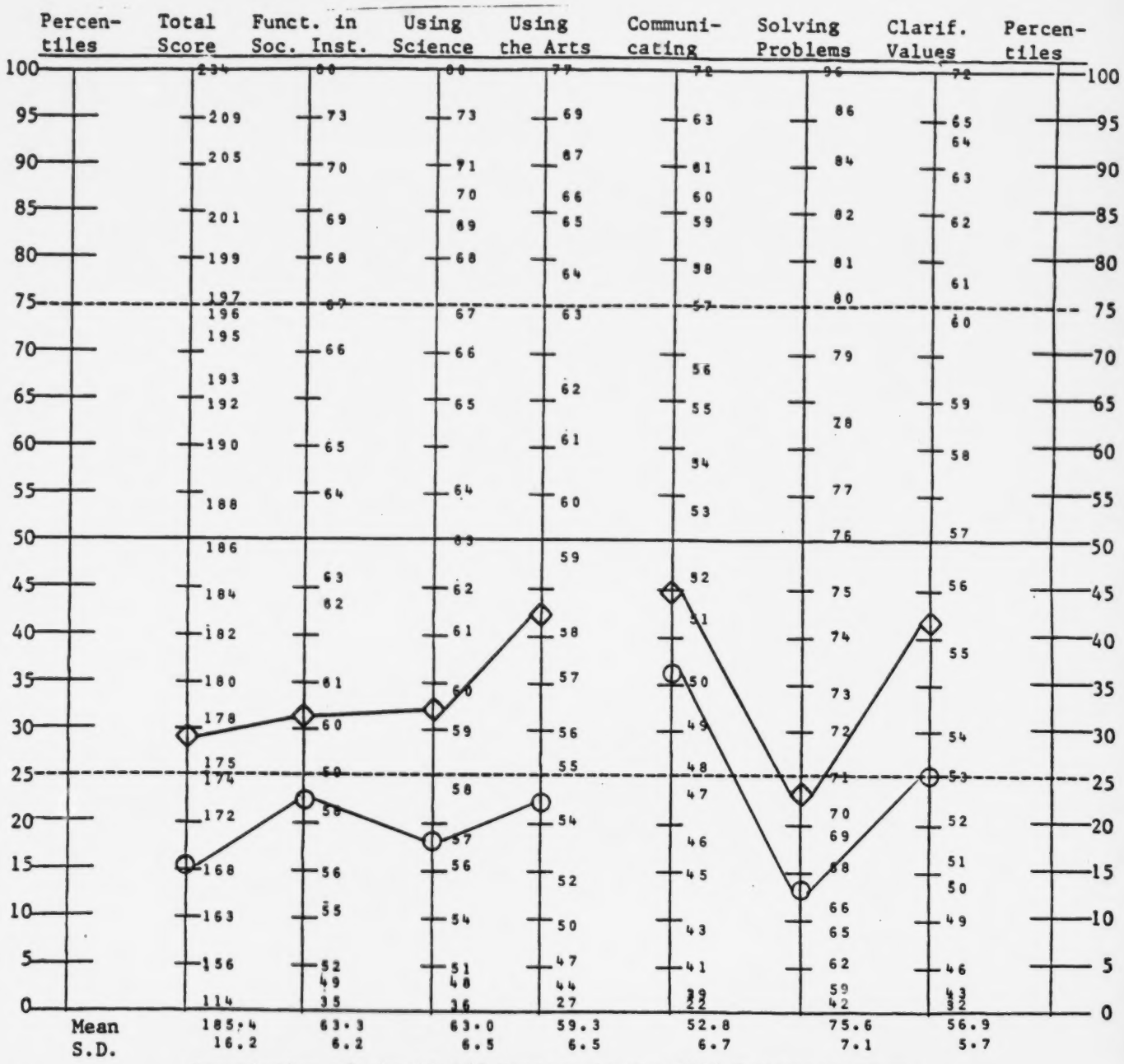
INST=TRENTON STATE C

| OBS | TYPE | INST | IDD | TT | NCNT | GRLVL1 | CODE | X | Y | ACTE | N_ACT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4 | TRENTON STATE C | 818 | 16 | 111 | 1 | 0 | TOTAL | 44.03 | 23.59 | 100 |
| 2 | 4 | TRENTON STATE C | 818 | 16 | 32 | 1 | 1 | TOTAL | 36.41 | 21.46 | 32 |
| 3 | 4 | TRENTON STATE C | 818 | 16 | 1 | 1 | 2 | TOTAL | 15.50 | 24.00 | 1 |
| 4 | 4 | TRENTON STATE C | 818 | 16 | 111 | 1 | 0 | FSI | 44.16 | 23.59 | 100 |
| 5 | 4 | TRENTON STATE C | 818 | 16 | 32 | 1 | 1 | FSI | 43.90 | 21.46 | 32 |
| 6 | 4 | TRENTON STATE C | 818 | 16 | 1 | 1 | 2 | FSI | 7.00 | 24.00 | 1 |
| 7 | 4 | TRENTON STATE C | 818 | 16 | 111 | 1 | 0 | US | 42.79 | 23.59 | 100 |
| 8 | 4 | TRENTON STATE C | 818 | 16 | 32 | 1 | 1 | US | 32.86 | 21.46 | 32 |
| 9 | 4 | TRENTON STATE C | 818 | 16 | 1 | 1 | 2 | US | 33.10 | 24.00 | 1 |
| 10 | 4 | TRENTON STATE C | 818 | 16 | 111 | 1 | 0 | UA | 55.48 | 23.59 | 100 |
| 11 | 4 | TRENTON STATE C | 818 | 16 | 32 | 1 | 1 | UA | 45.47 | 21.46 | 32 |
| 12 | 4 | TRENTON STATE C | 818 | 16 | 1 | 1 | 2 | UA | 32.70 | 24.00 | 1 |
| 13 | 4 | TRENTON STATE C | 818 | 16 | 111 | 1 | 0 | COM | 60.08 | 23.59 | 100 |
| 14 | 4 | TRENTON STATE C | 818 | 16 | 32 | 1 | 1 | COM | 59.50 | 21.46 | 32 |
| 15 | 4 | TRENTON STATE C | 818 | 16 | 1 | 1 | 2 | COM | 75.40 | 24.00 | 1 |
| 16 | 4 | TRENTON STATE C | 818 | 16 | 111 | 1 | 0 | SP | 32.61 | 23.59 | 100 |
| 17 | 4 | TRENTON STATE C | 818 | 16 | 32 | 1 | 1 | SP | 29.27 | 21.46 | 32 |
| 18 | 4 | TRENTON STATE C | 818 | 16 | 1 | 1 | 2 | SP | 1.50 | 24.00 | 1 |
| 19 | 4 | TRENTON STATE C | 818 | 16 | 111 | 1 | 0 | CV | 57.95 | 23.59 | 100 |
| 20 | 4 | TRENTON STATE C | 818 | 16 | 32 | 1 | 1 | CV | 44.48 | 21.46 | 32 |
| 21 | 4 | TRENTON STATE C | 818 | 16 | 1 | 1 | 2 | CV | 17.70 | 24.00 | 1 |

Table 11

SAMPLE MEANS FOR COMP
PLOTTED ON A PERCENTILE TABLE FOR 18,568 SENIORS AT 94 INSTITUTIONS

Key: ○ = Means for 32 Freshmen matched with Seniors (ACT/E mean = 21.5)
◇ = Means for 32 Type I Seniors (ACT/E mean = 21.4)




Description of the 18,568 Seniors in the 1984 Reference Group.

45% Men
55% Women

Area of Interest
49% Social Sciences
29% Natural Sciences
22% Arts/Humanities

Age Range
1% Age 19 or below
59% Age 20-22
29% Age 23-30
11% Over 30

ACT Composite (or equivalent for SAT Total) scores available for 11,163 Seniors. Mean 21.0

ACT Composite Range
2% below 10
6% 10-12
10% 13-15
14% 16-18
18% 19-21
20% 22-24
18% 25-27
10% 28-30
2% over 30

22

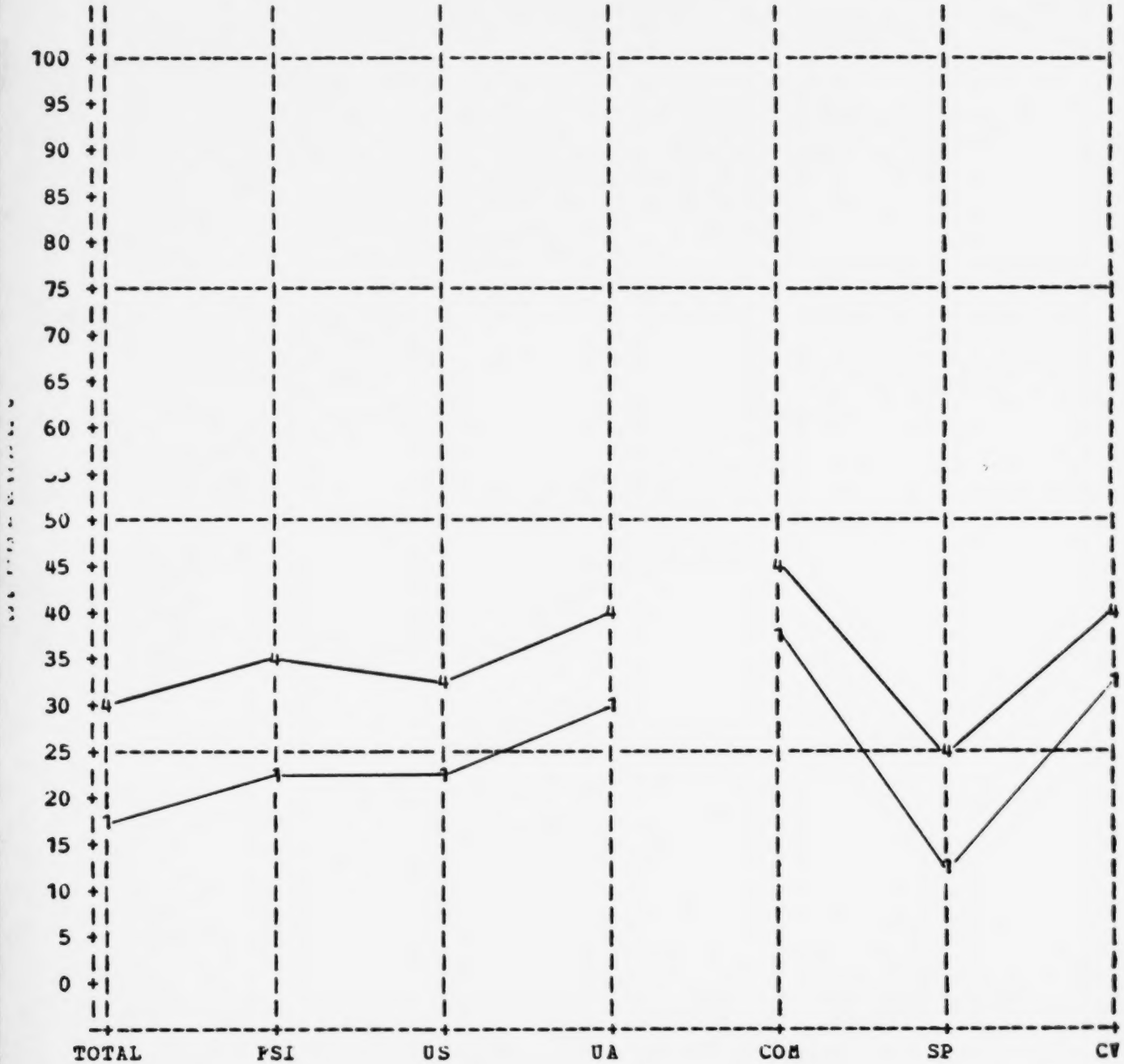
Table 12

COMP RESULTS PROFILED ON SENIOR REFERENCE GROUP NORMS
BASED ON PERCENTILES FOR 18,508 SENIORS AT 94 INSTITUTIONS
19:41 MONDAY, DECEMBER 17, 1984

PLOT OF PCTILE * SCALES SYMBOL IS VALUE FOR GRADE LEVEL
1=FRESHMEN 2=SOPHOMORE 3=JUNIORS 4=SENIORS
N=144 N=68

INST=TRENTON STATE C

PLOT OF Y*X SYMBOL IS VALUE OF GRADE




SUBTESTS 1-6 AND TOTAL SCORE

COMP RESULTS PROFILED ON SENIOR REFERENCE GROUP NORMS
BASED ON PERCENTILES FOR 18,568 SENIORS AT 94 INSTITUTIONS
19:41 MONDAY, DECEMBER 17, 1984
PLOT OF PCTILE * SCALES SYMBOL IS VALUE FOR GRADE LEVEL
1=FRESHMEN 2=SOPHOMORE 3=JUNIORS 4=SENIORS

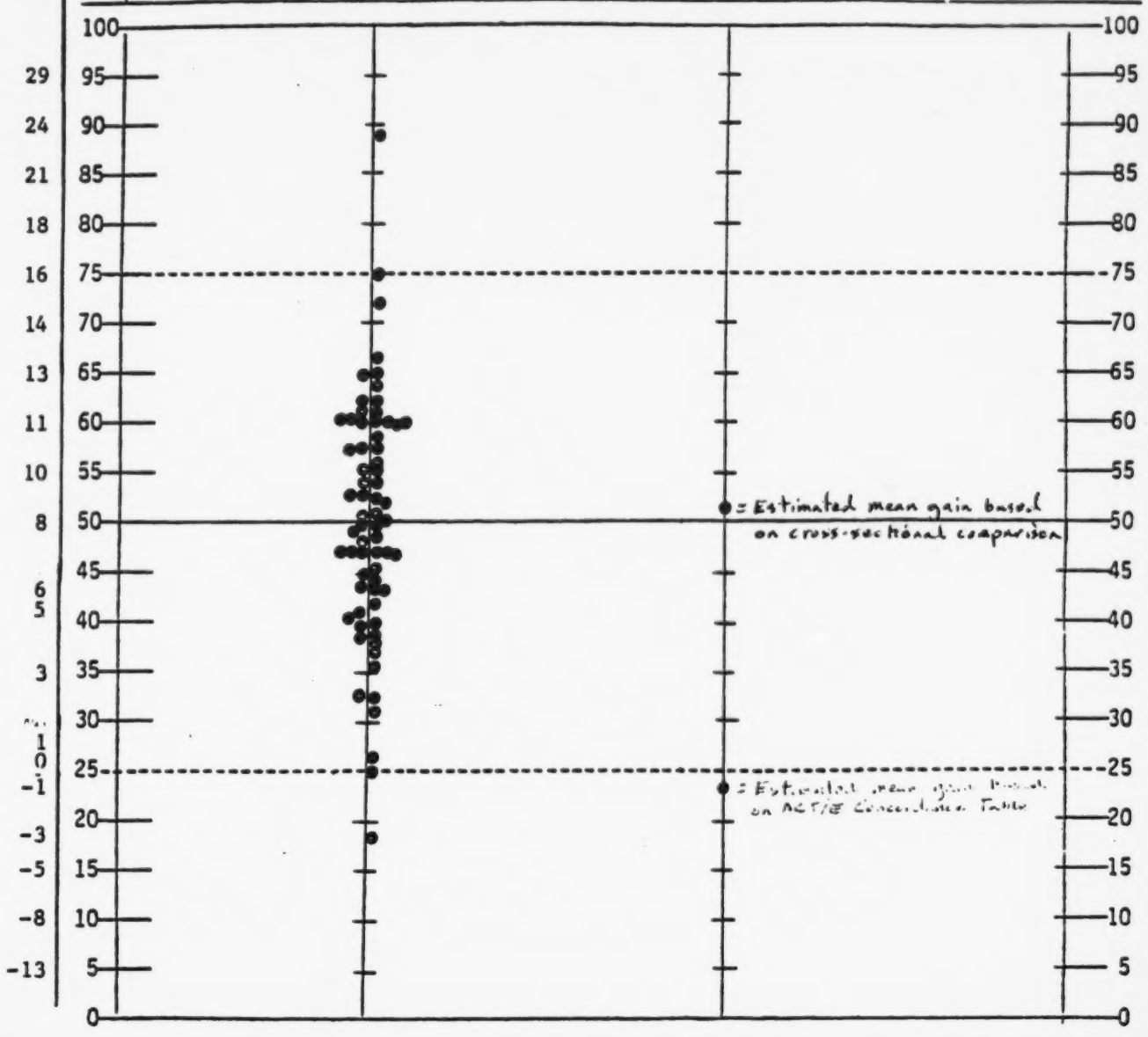
---------- INST=TRENTON STATE C ----------

| OBS | TYPE | INST | IDD | TT | NCNT | GRLVL1 | CODE | X | Y | ACTE | N_ACT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | TRENTON STATE C | 818 | 16 | 144 | 4 | 1 | TOTAL | 18.57 | 23.09 | 133 |
| 2 | 1 | TRENTON STATE C | 818 | 16 | 68 | 4 | 4 | TOTAL | 29.74 | 21.43 | 32 |
| 3 | 1 | TRENTON STATE C | 818 | 16 | 144 | 4 | 1 | FSI | 22.17 | 23.09 | 133 |
| 4 | 1 | TRENTON STATE C | 818 | 16 | 68 | 4 | 4 | FSI | 34.01 | 21.43 | 32 |
| 5 | 1 | TRENTON STATE C | 818 | 16 | 144 | 4 | 1 | US | 23.50 | 23.09 | 133 |
| 6 | 1 | TRENTON STATE C | 818 | 16 | 68 | 4 | 4 | US | 31.81 | 21.43 | 32 |
| 7 | 1 | TRENTON STATE C | 818 | 16 | 144 | 4 | 1 | UA | 28.97 | 23.09 | 133 |
| 8 | 1 | TRENTON STATE C | 818 | 16 | 68 | 4 | 4 | UA | 41.02 | 21.43 | 32 |
| 9 | 1 | TRENTON STATE C | 818 | 16 | 144 | 4 | 1 | COM | 37.01 | 23.09 | 133 |
| 10 | 1 | TRENTON STATE C | 818 | 16 | 68 | 4 | 4 | COM | 45.87 | 21.43 | 32 |
| 11 | 1 | TRENTON STATE C | 818 | 16 | 144 | 4 | 1 | SP | 13.26 | 23.09 | 133 |
| 12 | 1 | TRENTON STATE C | 818 | 16 | 68 | 4 | 4 | SP | 24.67 | 21.43 | 32 |
| 13 | 1 | TRENTON STATE C | 818 | 16 | 144 | 4 | 1 | CV | 32.97 | 23.09 | 133 |
| 14 | 1 | TRENTON STATE C | 818 | 16 | 68 | 4 | 4 | CV | 40.30 | 21.43 | 32 |

Table 13

Estimated COMP Total Score Gains for Seniors

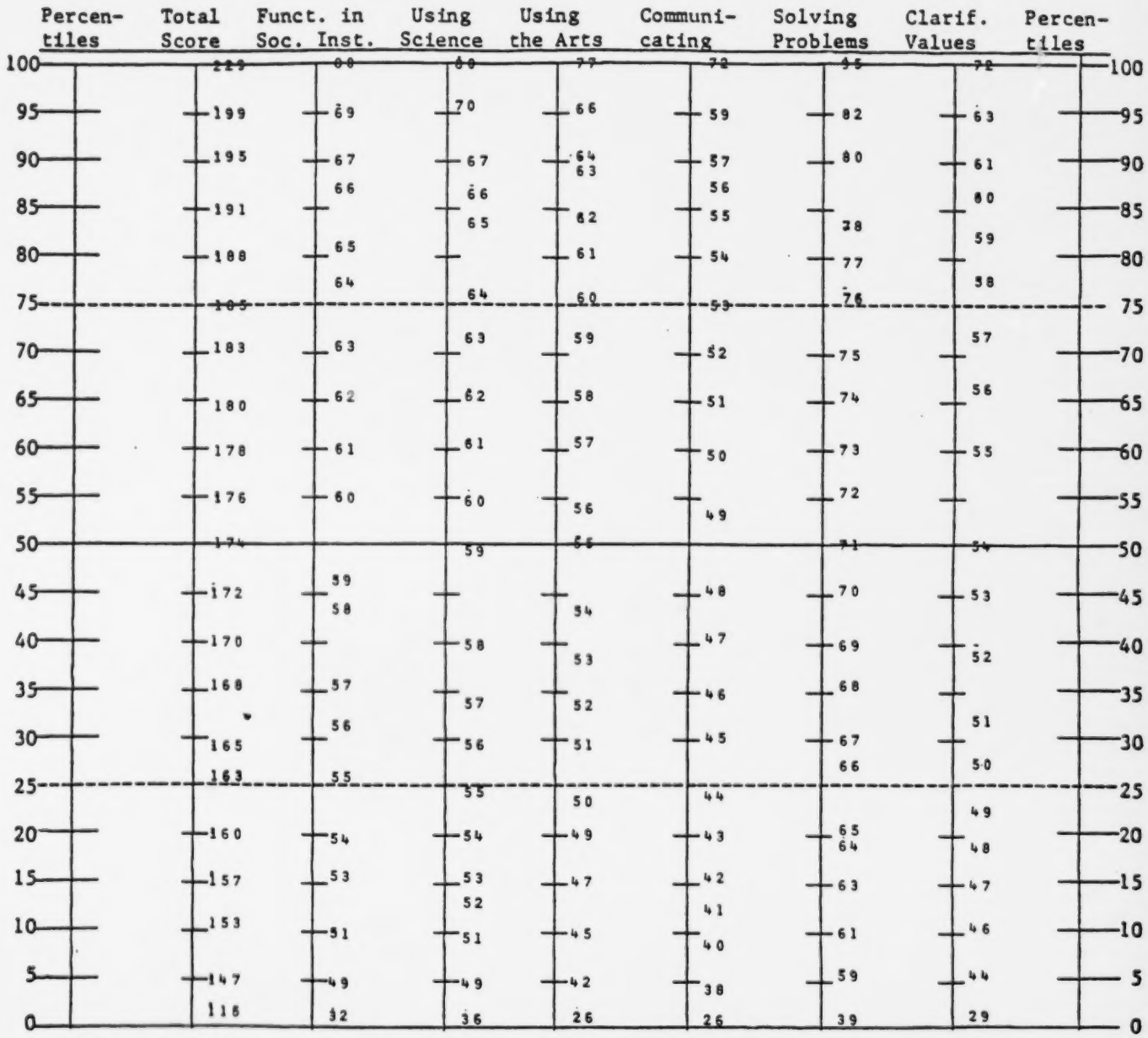
(Concordance Table for estimating score gains based on 7199 entering freshmen at 39 institutions; Percentile Table based on gains for 9221 seniors at 65 institutions.)




*See reverse side

1984 COMP Entering Freshmen Reference Group Norms
Based on 14,048 Freshmen at 61 Institutions

Directions: Circle the place where your score falls on each scale. Refer to the Percentiles to judge your performance compared to the others in the Freshmen Reference Group. (For example, if your total score was 173, you scored above almost 50% of those in this comparison group.)




| | Total Score | Funct. in Soc. Inst. | Using Science | Using the Arts | Communicating | Solving Problems | Clarif. Values |
|---|---|---|---|---|---|---|---|
| Mean | 174.2 | 59.7 | 59.7 | 55.3 | 49.1 | 71.2 | 54.0 |
| S.D. | 16.2 | 6.2 | 6.3 | 7.0 | 6.3 | 7.3 | 5.9 |

Description of the 14,048 Freshmen in the 1984 Reference Group.

40% Men
60% Women

Area of Interest
44% Social Sciences
34% Natural Sciences
22% Arts/Humanities

Age Range
92% Age 19 or below
4% Age 20-22
2% Age 23-30
1% Over 30

ACT Composite (or equivalent for SAT Total) scores available for 11,357 Freshmen. Mean 20.6

ACT Composite Range
2% below 10
5% 10-12
11% 13-15
16% 16-18
22% 19-21
20% 22-24
16% 25-27
9% 28-30
1% over 30

REPORT OF TEST RESULTS

COMP

TRENTON
STATE COLLEGE

**Office of Academic Affairs**

May 1, 1985

Dear Student:

As you will recall, you took a series of tests on general education in September, 1984. The tests have been scored and we are reporting the test results to you. You can judge your performance on the tests in comparison with other Trenton State College students who took the same tests. Your test scores and tables for score interpretation are enclosed.

If you have any questions, please call Dr. Henry Wang at (609)-771-2634 or stop by his office in Forcina Hall, Room 450, Monday through Wednesday, from 9:00 a.m. to 4:00 p.m. He will be willing to answer your questions.

Thank you again for your participation in the general education assessment study. You have made an important contribution to the project. Best wishes for a successful academic year.

Sincerely yours,

A J DiGiorgio

Dr. Anthony DiGiorgio
Vice President for Academic Affairs

Henry S. Wang

Dr. Henry Wang
Director, General Education
Assessment Study

COLLEGE OUTCOME MEASURES PROJECT

Report on Test Results for:

ESSAY QUESTIONS

| COMMUNICATION | | YOUR SCORE: |
|---|---|---|
| Q111 | Oil Refining (Natural Science and Mathematics | _____ |
| Q122 | Paragraph Style (Humanities) | _____ |
| Q133 | Life on Pluto (Social and Behavioral Sciences) | _____ |
| Q142 | Historical Thinking (History and Political Science) | _____ |

| CULTURAL AWARENESS | | |
|---|---|---|
| Q413 | Ephemeral Insects (Assesses Awareness of Nature and Limitations of Science) | _____ |
| Q424 | Haiku (Assesses Social Sensitivity Expressed in Poetry Form) | _____ |
| Q441 | Presidential Candidate (Assesses Social and Political Awareness) | _____ |
| Q436 | Canada (Assesses Perception of Social Implications of Political Acts and the Exercise of Political Power to Achieve Political Goals) | _____ |

Refer to Tables 1 and 2 for score interpretation.

COMP OBJECTIVE TEST FORM VII EQUATED TO III

RESULTS FOR:
ARTICOLO NANCY A
TRENTON STATE C
GRADE13
DATE 9 1984

| | YOUR SCORE |
|---|---|
| TOTAL SCORE | 173 |
| AREA SUBSCORES: | |
| FUNCTIONING WITHIN SOCIAL INSTITUTIONS | 56 |
| USING SCIENCE AND TECHNOLOGY | 65 |
| USING THE ARTS | 54 |
| COMMUNICATING | 44 |
| SOLVING PROBLEMS | 73 |
| CLARIFYING VALUES | 60 |

FUNCTIONING WITHIN SOCIAL INSTITUTIONS:
ABILITY TO IDENTIFY THOSE ACTIVITIES AND INSTITUTIONS WHICH CONSTITUTE THE SOCIAL ASPECTS OF A CULTURE, UNDERSTAND THE IMPACT THAT SOCIAL TITUTIONS HAVE ON INDIVIDUALS, AND ANALYZE THE FUNCTIONING OF RSELF AND OTHERS WITHIN SOCIAL INSTITUTIONS.

USING SCIENCE AND TECHNOLOGY:
ABILITY TO IDENTIFY THE SCIENTIFIC/TECHNOLOGICAL ASPECTS OF A CULTURE, UNDERSTAND THE IMPACT OF SUCH ACTIVITIES AND PRODUCTS ON INDIVIDUALS AND ANALYZE THE CONSEQUENCES OF USING TECHNOLOGICAL PRODUCTS FOR BOTH YOURSELF AND THE CULTURE.

USING THE ARTS:
ABILITY TO IDENTIFY THOSE ACTIVITIES AND PRODUCTS WHICH CONSTITUTE THE ARTISTIC ASPECTS OF A CULTURE, UNDERSTAND THE IMPACT THAT ART IN ITS VARIOUS FORMS HAS ON INDIVIDUALS, AND ANALYZE THE USE OF WORKS OF ART BY YOURSELF AND OTHERS.

COMMUNICATING:
ABILITY TO SEND AND RECEIVE INFORMATION IN A VARIETY OF MODES (ORAL, WRITTEN, GRAPHIC) FOR A VARIETY OF PURPOSES (TO INFORM, TO PERSUADE, TO ANALYZE).

SOLVING PROBLEMS:
ABILITY TO DEFINE A VARIETY OF PROBLEMS, SELECT APPROACHES TO SOLVE THEM, GENERATE SOLUTIONS, COLLECT INFORMATION, CHECK LOGICAL CONSISTENCY, SELECT A GOOD SOLUTION, AND EVALUATE THE PROCESS BY WHICH A PROBLEM WAS SOLVED.

C RIFYING VALUES:
A ITY TO IDENTIFY YOUR OWN VALUES AND THE VALUES OF OTHERS, UNDERSTAND HOW VALUES DEVELOP, AND ANALYZE THE IMPLICATIONS OF DECISIONS MADE BY ONESELF OR OTHERS BASED ON THOSE VALUES.

for 144 Freshmen at Trenton State College tested in Sept 1984

Directions: Circle the place where your score falls on each scale. Refer to the Percentiles to judge your performance compared to the others tested at your institution. (For example, if your total score was 177 you scored above almost 50% of those in this comparison group.)

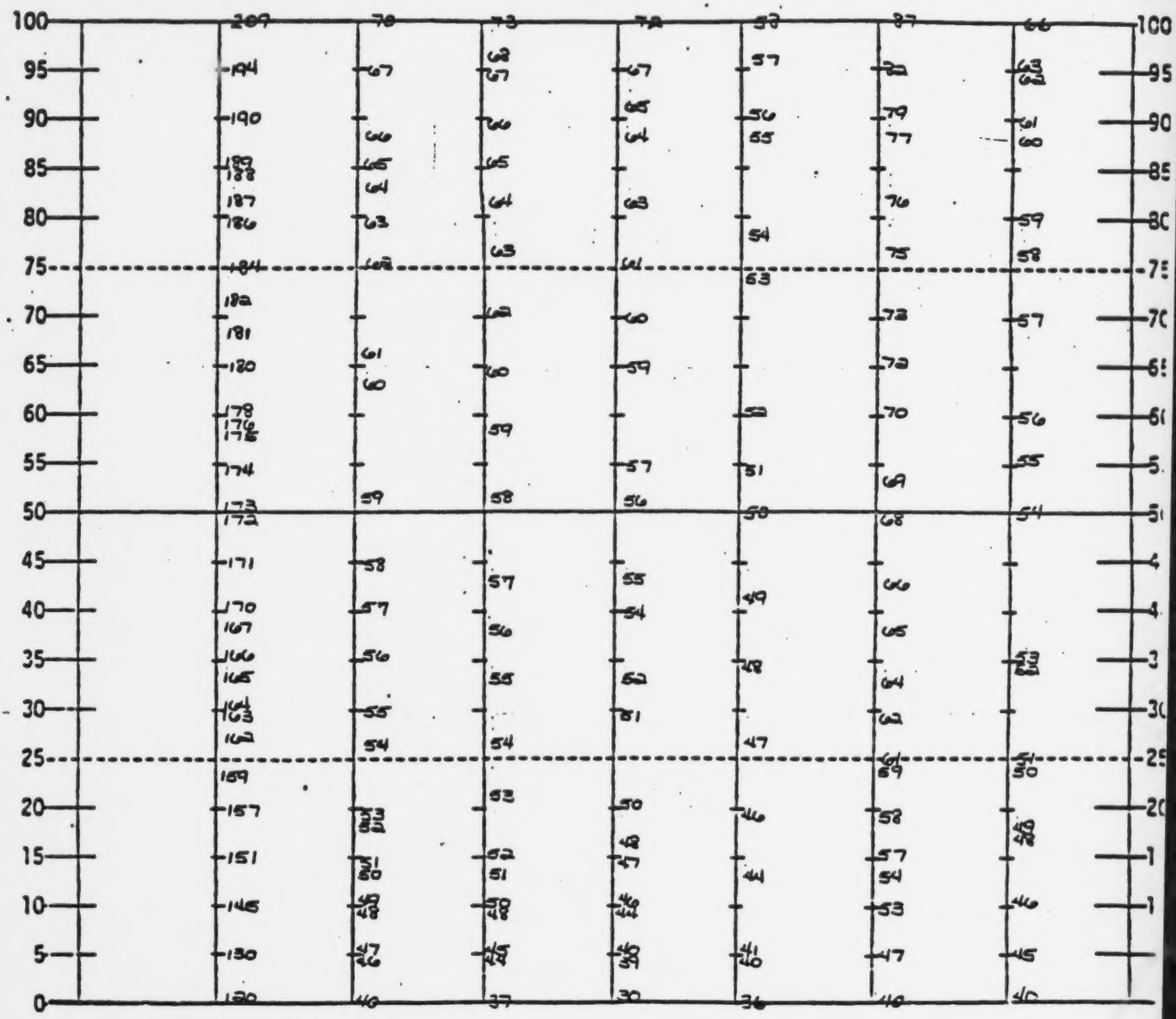


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TABLE 1
ESSAY QUESTIONS. COMMUNICATION

Refer to the cumulative percentages below to judge your performance on the essay questions compared to other Freshmen or Seniors who took the test in September, 1984.

Example: If your score was 2 on Question 111, this indicates that 92% of the Freshmen scored at or below 2.

Please note that 1 was the highest possible score, and 7 was the lowest.

| | Question 111 Oil Refining Process | | | Question 124 Paragraph Style | | | Question 133 Life on Pluto | | | Question 142 Historical Thinki | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Score | Freshmen | Seniors | | Freshmen | Seniors | | Freshmen | Seniors | | Freshmen | Senic |
| High 1 | 100% | 100% | 1 | 100% | 100% | 1 | 100% | 100% | 1 | 100% | 100 |
| 2 | 92 | 81 | 2 | 83 | 75 | 2 | 84 | 74 | 2 | 96 | 9 |
| 3 | 84 | 74 | 3 | 50 | 49 | 3 | 59 | 48 | 3 | 91 | 78 |
| Middle 4 | 68 | 55 | 4 | 30 | 26 | 4 | 33 | 42 | 4 | 83 | 6 |
| 5 | 55 | 46 | 5 | 21 | 14 | 5 | 14 | 22 | 5 | 75 | 5 |
| Low 6 | | | 6 | 8 | 10 | 6 | 8 | 15 | 6 | 67 | 5 |
| 7 | | | 7 | 6 | 9 | 7 | 6 | 14 | 7 | 50 | 37 |
| | F=112 | S=10 | | F=113 | S=10 | | F=130 | S=66 | | F=143 | S=6 |

111

112

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TABL. .

ESSAY QUESTIONS: CULTURAL AWARENESS

| Score | Question 413 Ephemeral Insects Freshmen | Seniors | Question 424 Haiku Freshmen | Seniors | Question 436 Canada Freshmen | Seniors | Question 441 Presidential Candid Freshmen | Seniors |
|---|---|---|---|---|---|---|---|---|
| 1 | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| 2 | 94 | 94 | 98 | 90 | 97 | 90 | 87 | 84 |
| 3 | 84 | 66 | 80 | 73 | 72 | 59 | 73 | 49 |
| 4 | 74 | 41 | 60 | 56 | 65 | 55 | 36 | 20 |
| 5 | 60 | 24 | 49 | 44 | 34 | 35 | 31 | 19 |
| 6 | 33 | 13 | 21 | 28 | 19 | 20 | 13 | 10 |
| 7 | | | | | 4 | 4 | | 114 |
| | F=113 | S=13 | F=113 | S=13 | F=113 | S=13 | F=147 | S=69 |

REPORT OF TEST RESULTS

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TRENTON
STATE COLLEGE

**Office of Academic Affairs**

May 1, 1985

Dear Student:

As you will recall, you took a series of tests on general education in September, 1984. The tests have been scored and we are reporting the test results to you. You can judge your performance on the tests in comparison with other Trenton State College students who took the same tests. Your test scores and tables for score interpretation are enclosed.

If you have any questions, please call Dr. Henry Wang at (609)-771-2634 or stop by his office in Forcina Hall, Room 450, Monday through Wednesday, from 9:00 a.m. to 4:00 p.m. He will be willing to answer your questions.

Thank you again for your participation in the general education assessment study. You have made an important contribution to the project. Best wishes for a successful academic year.

Sincerely yours,

A J DiGiorgio

Dr. Anthony DiGiorgio
Vice President for Academic Affairs

Henry S. Wang

Dr. Henry Wang
Director, General Education
Assessment Study



Trenton State College, Hillwood Lakes CN 550, Trenton, NJ 08625 609·771·3080

TESTS OF GENERAL EDUCATION

Report on Test Results for:

I. MULTIPLE-CHOICE TEST

| AREA SUBSCORES: | YOUR SCORE: |
|---|---|
| COMMUNICATION | _____ |
| MATH | _____ |
| ANALYTICAL THINKING | _____ |
| INTEGRATIVE | _____ |
| TOTAL SCORE | _____ |

Ranges for Freshmen

| | COMM. | MATH | ANALY. | INTEG. | TOTAL |
|---|---|---|---|---|---|
| Top 25% | 10-16 | 17-24 | 9-12 | 10-14 | 42-58 |
| Upper-Middle 25% | 9 | 14-16 | 7-8 | 8-9 | 37-41 |
| Lower-Middle 25% | 6-8 | 12-13 | 6 | 7 | 13-36 |
| Bottom 25% | 0-5 | 4-11 | 1-5 | 1-6 | 15-30 |

Example: If your total score was 42 or higher, you were roughly among the top 25% of the Freshmen tested in September, 1984 at Trenton State College.

Ranges for Seniors

| | COMM. | MATH | ANALY. | INTEG. | TOTAL |
|---|---|---|---|---|---|
| Top 25% | 12-16 | 19-24 | 9-12 | 10-13 | 45-58 |
| Upper-Middle 25% | 10-11 | 15-18 | 8 | 8-9 | 38-44 |
| Lower-Middle 25% | 9 | 12-14 | 6-7 | 6-7 | 34-37 |
| Bottom 25% | 0-8 | 4-11 | 1-5 | 3-5 | 19-33 |

II. ESSAY QUESTIONS

| COMMUNICATION | YOUR SCORE: |
|---|---|
| Q111 Oil Refining (Natural Science and Mathematics) | _____ |
| Q122 Paragraph Style (Humanities) | _____ |
| Q133 Life on Pluto (Social and Behavioral Sciences) | _____ |
| Q142 Historical Thinking (History and Political Science) | _____ |

CULTURAL AWARENESS

| | |
|---|---|
| Q413 Ephemeral Insects (Assesses Awareness of Nature and Limitations of Science) | _____ |
| Q424 Haiku (Assesses Social Sensitivity Expressed in Poetry Form) | _____ |
| Q441 Presidential Candidate (Assesses Social and Political Awareness) | _____ |
| Q436 Canada (Assesses Perception of Social Implications of Political Acts and the Exercise of Political Power to Achieve Political Goals) | _____ |

TABLE
ESSAY QUESTIONS: . .MUNICATION

**Refer to the cumulative percentages below to judge your performance on the essay questions compared to other Freshmen or Seniors who took the test in September, 1984.**

**Example: If your score was 2 on Question 111, this indicates that 96% of the Freshmen scored at or below 2.**

**Please note that 1 was the highest possible score, and 7 was the lowest.**

| | Question 111 Oil Refining Process | | Question 124 Paragraph Style | | Question 133 Life on Pluto | | Question 142 Historical Thinking | |
|---|---|---|---|---|---|---|---|---|
| Score | Freshmen | Seniors | Freshmen | Seniors | Freshmen | Seniors | Freshmen | Seniors |
| 1 | 100 % | 100 % | 100 % | 100 % | 100 % | 100 % | 100 % | 100 % |
| 2 | 96 | 81 | 88 | 86 | 86 | 91 | 87 | 89 |
| 3 | 91 | 69 | 58 | 61 | 77 | 69 | 70 | 74 |
| 4 | 78 | 47 | 32 | 41 | 58 | 55 | 63 | 69 |
| 5 | 62 | 30 | 21 | 30 | 26 | 25 | 39 | 41 |
| 6 | | | 7 | 0 | 10 | 14 | 33 | 30 |
| 7 | | | 7 | 11 | 8 | 6 | 16 | 19 |

High / Middle / Low

F=159 — S=64

TABLE 2

ESSAY QUESTIONS: CULTURAL AWARENESS

| Score | Question 413 Ephemeral Insects Freshmen | Seniors | Question 424 Haiku Freshmen | Seniors | Question 436 Canada Freshmen | Seniors | Question 441 Presidential Candidate Freshmen | Seniors |
|---|---|---|---|---|---|---|---|---|
| 1 | 100 % | 100 % | 100 % | 100 % | 100 % | 100 % | 100 % | 100 % |
| 2 | 94 | 81 | 94 | 95 | 95 | 92 | 93 | 84 |
| 3 | 80 | 60 | 72 | 66 | 72 | 54 | 75 | 57 |
| 4 | 59 | 43 | 47 | 45 | 60 | 42 | 29 | 24 |
| 5 | 53 | 35 | 32 | 26 | 31 | 20 | 28 | 21 |
| 6 | 21 | 13 | 12 | 17 | 13 | 11 | 20 | 10 |
| 7 | 120 | | | | 1 | 0 | | 12 |

TRENTON
STATE COLLEGE

**Office of Academic Affairs**

August 27, 1984

Dear Faculty Colleague:

This Fall the College will be embarking on a new venture. For the first time in the history of the College we will be testing students in the academic area across the institution. There is a nationwide movement toward outcomes assessment and the Chancellor, in a report to the Board of Higher Education, has called for extensive testing of student outcomes in the colleges and universities of New Jersey. We are in advance of these mandates and are concentrating our efforts in the area of general education.

As you may be aware the Ad Hoc Committee on the Assessment of General Education, which was appointed by the Academic Policies Committee, has been actively involved over the past two years in the task of assessing the outcomes of general education. Eight learning objectives have been identified and reviewed by the academic community. Every department with courses meeting Distribution Requirements has worked with the committee to identify the relationship of each course to those learning objectives. Now the Committee has authorized a pilot study this Fall utilizing two instruments to be administered to sample groups of Freshmen and Seniors. Dr. Henry Wang of the Psychology Department is in charge of this project and will be administering the testing.

The nature of the tests is such that only broad areas such as communicating, solving problems, clarifying values are covered. We will not get feedback that will relate to specific courses, departments, or programs but we will gain valuable information that will enable us to take a critical look at our general education curriculum, how our students perform against national norms, and how adequate the instruments themselves may be.

If we wish to continue to emerge as a distinctive college within the State and to separate ourselves from the "pack", it is incumbent upon us to be certain that we have the best curriculum to match the quality of our student body and to present evidence that our students perform at a level that will support our claim of distinctiveness. I urge the cooperation, assistance, and support of every member of the academic community as we conduct this important pilot study. For many of you assistance will mean only being very positive about the testing as you relate to students. For others you will be asked to excuse students from your classes for the testing and will be asked to consider the testing as a course requirement. Those of you who will be more involved will be contacted directly by Dr. Wang or Dean Curry.

Thank you for your support.

Sincerely yours,

Gordon Goewey
Provost

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Trenton State College, Hillwood Lakes CN 550, Trenton, NJ 08625 609-771-3080

TRENTON
STATE COLLEGE

Office of Academic Affairs

September 10, 1984

Dear Student:

The College has decided to conduct a large-scale general education assessment program during the week of September 23, 1984. The purpose of the assessment program is to measure systematically what Trenton State College students have learned as a result of exposure to the general education (distribution) requirements.

Through months of careful planning, an assessment procedure has been devised. Six hundred students have been selected to participate. You are one of the 600 students who will make an important contribution to the success of this program. To be part of this high priority research project of the College, you will need to devote about four hours of your time during the coming week.

It is extremely important for you to do your best; however, you need not prepare for the assessment. All you have to do is be on time on the scheduled date and function at your peak efficiency.

Scores earned by Seniors will be matched and compared with those earned by Freshmen. Four years from now, Freshmen will be tested again when they are Seniors. In addition, the performance by both Seniors and Freshmen will be compared with the performance of students in other colleges and universities across the country. We are all proud of Trenton State College and are very anxious to demonstrate the quality of education received here.

If you are interested in knowing how you performed individually, we will give you (and only you) your test results. This information can be of value to you as you assess your strengths and weaknesses and plan for the future.

The assessment is a requirement for you in this course. Your professor will grant extra credit toward the final course grade upon successful completion of this assessment process. A contract to be signed by you and your professor, along with information on the testing date, time, and place, is enclosed with this letter. Please fill in the requested information and, after signing, present the signed contract to your instructor for his/her signature. At the end of your participation, Dr. Wang the Director of the Project will sign the contract. You can then submit the contract to your instructor for his/her record. If you receive more than one copy of this letter, please ask only one of your instructors to sign the contract.

Thank you for your cooperation and best wishes for a successful academic year.

Sincerely yours,

Gordon Goewey

Gordon I. Goewey
Provost

Henry Wang

Henry Wang
Director, General Education Assessment Study

Trenton State College, Hillwood Lakes CN 550, Trenton, NJ 08625 609·771·3

TRENTON
STATE COLLEGE

Office of the Dean of Arts and Sciences

September 10, 1984

Dear

Recently you received a letter from Dr. Goewey explaining the purpose behind the test of General Education which we are conducting this month. I would like to stress the importance of this study. In order to consider proposed revisions of the GE program, the Academic Policies Committee needs data as to the academic strengths and weaknesses of our graduates. As you are probably aware, the accrediting agencies and the Board of Higher Education have also asked that we conduct studies on the success of our program. Finally, clear evidence that a Trenton State graduate is superior to those of other colleges will be most persuasive to employers, applicants, and the Legislature.

One of your classes, Section , contains students who are subjects in the study. It is vitally important that all of the subjects participate; otherwise, the sample will not be random, and no valid conclusion can be drawn. We are relying upon you to make certain that your students take the examination. Would you please do the following:

1. Complete Section I of the contract in the letter to your students.

2. At the next meeting of your class, distribute the enclosed letters to the student or students in your class. If any are absent, please make certain that they receive the letter at the following meeting.

3. Impress upon the students that the exam is a course requirement and that it is important for them to be on time and to do their best. Tell them that the Provost will provide excused absences for a class scheduled at the same time as the examination.

4. Require your students to take the examination on the scheduled date or the alternate date. If any students absolutely cannot be present on either date, please send his or her name to Dr. Wang, Psychology Department, by September 11. Please ask the student to schedule an appointment with Dr. Wang, through the department secretary, 2427, to arrange for a make-up examination.

5. The students will return the signed contract indicating that they have taken the exam. You may keep it for your records.

Trenton State College, Hillwood Lakes CN 550, Trenton, NJ 08625 609·771·2277

The General Education Committee and both of us appreciate your help and cooperation.

Cordially yours,

Wade Curry

Wade Curry, Dean
Arts and Sciences

Henry Wang

Henry Wang, Director
General Education Assessment Study

TRENTON
STATE COLLEGE

September 17, 1984

Dear Faculty Member:

Recently, some of you received a packet of letters for the students in your classes who had been selected to participate in the General Education study. In response to faculty questions and after discussion with the administration, we want to inform you that the taking of the General Education examination need not impact upon students' grades in the courses they are taking. The determination of the factors used in grading is the prerogative of the instructor. However, we wish to urge the cooperation of these faculty in helping to get the students to participate.

You are already aware of the purpose and the importance of this study. The information to be gathered not only is of value to us as faculty but will help our students to learn the effectiveness of the program they are taking. Doing what you can to help assure student participation in this study will be valued by all of us who are concerned with what we are trying to accomplish at Trenton State College.

ON A RELATED MATTER: Unfortunately, the assigned examination date and the alternate date cause a conflict for some students who will be observing the Jewish holiday of Rosh Hashanah (September 26 and 27). Students should be informed that those with this conflict may take the examination on Tuesday, October 2, at 5:30 p.m. in either Forcina Hall 134 or 130.

We do appreciate your help and cooperation.

Cordially yours,

Arthur M. Steinman
President, Local 2364 AFT

Henry Wang
Psychology Department



Trenton State College, Hillwood Lakes CN 550, Trenton, NJ 08625 609-771-3080